

INTERIM REPORT
ON
THE UNITED NATIONS AND THE ISSUE
OF DEEP OCEAN RESOURCES
TOGETHER WITH HEARINGS
BY THE
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS
OF THE
COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES

PURSUANT TO

H. Res. 179

A RESOLUTION AUTHORIZING THE COMMITTEE ON FOREIGN AFFAIRS TO CONDUCT THOROUGH STUDIES AND INVESTIGATIONS OF ALL MATTERS COMING WITHIN THE JURISDICTION OF THE COMMITTEE



COMPLIMENTS OF
YOUR CONGRESSMAN
DANTE B. FASCELL

DECEMBER 7, 1967.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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FOREWORD

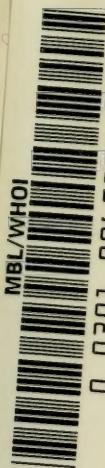
HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
Washington, D.C., December 7, 1967.

The findings and recommendations of the interim report on "The United Nations and the Issue of Deep Ocean Resources," submitted to the Committee on Foreign Affairs by Representative Dante B. Fascell, chairman of the Subcommittee on International Organizations and Movements, do not necessarily reflect the views of the membership of the Committee on Foreign Affairs. This report is filed in the hope that it will prove useful to the Congress in its consideration of legislation.

THOMAS E. MORGAN, *Chairman.*

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LETTER OF TRANSMITTAL

DECEMBER 7, 1967.

HON. THOMAS E. MORGAN,
Chairman, Committee on Foreign Affairs,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: I am pleased to transmit herewith the interim report on "The United Nations and the Issue of Deep Ocean Resources," prepared by the Subcommittee on International Organizations and Movements, together with hearings held by our subcommittee on this subject.

It is hoped that the information contained herein will be useful to the members of the committee, to the Congress, and to the executive branch.

DANTE B. FASCELL,
Chairman, Subcommittee on International
Organizations and Movements.

90TH CONGRESS <i>1st Session</i>	}	HOUSE OF REPRESENTATIVES	}	REPORT No. 999
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THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

DECEMBER 7, 1967.—Committed to the Committee of the Whole House on the
State of the Union and ordered to be printed

Mr. FASCELL, from the Committee on Foreign Affairs,
submitted the following

R E P O R T

[Pursuant to a resolution (H. Res. 179, 90th Cong.) authorizing the Committee
on Foreign Affairs to conduct thorough studies and investigations of all
matters coming within the jurisdiction of such committee]

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THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

I. INTERIM REPORT

A. INTRODUCTION

On August 17, 1967, the Permanent Mission of Malta to the United Nations proposed that the agenda of the 22d U.N. General Assembly, scheduled to convene in New York on September 19, include the following item:

Declaration and treaty concerning the reservation exclusively for peaceful purposes of the seabed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind.

An exploratory memorandum accompanying this proposal expressed concern that the rapid progress in marine technology could lead to the extension of national claims to the ocean floor, the appropriation of resources "of immense potential benefit to the world" by the technologically developed countries, and the use of the seabed and the ocean floor for military purposes.

In order to forestall such developments, the memorandum proposed that the seabed and the ocean floor be declared "a common heritage of mankind" and reserved exclusively for peaceful purposes. It was further proposed that an international framework be created for the use and economic exploitation of the seabed and the ocean floor. The net financial benefits derived from such activities were proposed to be used "primarily to promote the development of poor countries."

The full texts of the *note verbale* of Malta, of the accompanying explanatory memorandum, and of the revised item which was subsequently placed on the agenda of the 22d General Assembly, appear in the appendix.

The prospects of imminent action in the United Nations on the Maltese proposal provoked considerable concern. During August and September 1967, nearly two dozen resolutions were introduced in the U.S. Congress, expressing opposition to the vesting of control over deep ocean resources in an international body. Although the language of these resolutions differed in some respects, most of them expressed the view that, for the present, the vesting of such control would be premature. One resolution, introduced on October 25, endorsed the approach suggested by Malta. Most of the resolutions relating to this issue were referred to the Committee on Foreign Affairs and assigned to the Subcommittee on International Organizations and Movements for such action as the subcommittee deemed appropriate.

B. SUBCOMMITTEE ACTION

On September 18, 1967, Representative Dante B. Fascell, chairman of the Subcommittee on International Organizations and Movements, announced that hearings on the resolutions would begin immediately before his subcommittee. Sponsors of the resolutions and the U.S. Department of State were invited to present testimony during the opening session.

The hearings commenced on September 22 and continued intermittently through October 31. Testimony was received from Members of Congress, executive branch officials, and public witnesses. In both open and executive session, the subcommittee addressed itself to the wording of the resolutions before it; to the procedures used in arriving at, and the substance of, the U.S. Government's position on the pending legislation and the Maltese proposal; to the operational maritime programs of various U.S. Government agencies, including those of the Department of the Interior, the Department of Commerce, and the Defense Establishment; to the activities of the National Council on Marine Resources and Engineering Development, and of the Commission on Marine Science, Engineering, and Resources; and to the complex legal, political, and economic considerations involved in the legislation before it.

On November 2, the subcommittee met in an executive session, reviewed its work to date, and agreed to issue an interim report of its findings and recommendations.

C. ISSUES AT STAKE

The oceans cover nearly two-thirds of the area of the world and represent the last great frontier for natural resources on our planet. They are—and have been for thousands of years—essential to communications, security, and the well-being of a very substantial portion of the human population. With modern-day advances in marine technology, both for peaceful and for military purposes, and with the rising pressure on the available natural resources caused by the phenomenal growth of the world's population, the oceans' importance to the future of mankind has been increasing each year.

The prospect of using the wealth of the seas for the benefit of all mankind has tremendous appeal. The promise of reducing the area of international conflicts, with their present-day potential for mass destruction, is equally compelling.

The basic question before the United States, and all other nations, is how these objectives can be attained in the most effective manner without jeopardizing the legitimate interests and the security of any nation.

It is when we honestly face this question that the complexity of the issues which need to be resolved begins to reveal itself.

In our view, these issues must be faced squarely. Based on our hearings and investigations to date, the unresolved questions include the following:

a. What Is a "Sea"?

The resolutions referred to this subcommittee, and the proposal of the Permanent Mission of Malta to the United Nations, use terms whose meaning is neither legally nor otherwise clear. They refer to the "deep sea" and the "deep ocean" in the first instance, and to the "seabed" and the "ocean floor" in the other. What do these terms mean?

International law, and national claims, define "territorial waters" as extending variously 3, or 12, or 200 miles offshore.

In a somewhat similar manner, the "Continental Shelf," over which limited national sovereignty has been established by the Convention on the Continental Shelf, is defined to include offshore areas up to the depth of 200 meters—or as much farther as modern technology can take us for purposes of economic exploitation.

With natural resources being collected, and extracted, from the ocean floor lying thousands of feet beneath the ocean's surface, where is the outside perimeter of the Continental Shelf?

And where does the "deep sea," or the "deep ocean," begin?

Testimony presented before our subcommittee indicates that as yet we do not have definitive answers to these questions.

b. What Are the "Resources" of the Deep Seas?

Both the resolutions and the Maltese proposal concern themselves with the resources of the seas.

What are these "resources"? Do they include the use of the oceans' surface for transportation, communications, or other purposes? Do they refer to the fish and the vegetable matter which can multiply in the ocean waters? Are they restricted to the minerals which can be collected off the ocean floors? Or do they also include materials which can be mined below those floors?

Again, the precise meaning of the terms which are central to the decisions that the United Nations is being asked to make is not clear.

Even if we should be able, through some fortuitous meeting of the minds on a global scale, to arrive at the physical and geographic limits of the "resources" in question, how much is really known about them? Experts who have devoted many years to the study of this subject testified before our subcommittee to the effect that, at present, we can only guess regarding the exact nature, and the extent, of ocean resources.

c. What Is "Jurisdiction"?

Another issue raised in the proposal under study pertains to the definition of such words as "control," "jurisdiction," and "sovereignty."

Within the context of the proposal advanced by Malta, what do these terms mean?

For example, to what extent would international jurisdiction over the "seabed and the ocean floor," proposed by Malta, impair the sovereignty of the coastal states affirmed by the Convention on the Continental Shelf?

Our witnesses have been unable to answer this question.

d. What About the Ongoing National and International Marine Activities?

In December of 1966, the General Assembly of the United Nations ordered a comprehensive survey of activities in marine science and technology undertaken in the United Nations or by member states and private bodies.

A report of this survey may not be ready until the convening of the 23d General Assembly, in the fall of 1968.

In 1966, the Congress of the United States created the National Council on Marine Resources and Engineering Development and the Commission on Marine Science, Engineering and Resources to review the marine activities of the United States, to coordinate Federal programs in this field, and to recommend the framework of a national marine policy.

Neither of these organizations will be ready to submit a report of its findings and recommendations for some time.

Testimony presented before our subcommittee further indicates that numerous specialized agencies of the United Nations and other intergovernmental bodies are currently conducting a variety of marine research and exploration programs. Still other international organizations are promulgating and attempting to police various rules regarding the use of the seas for navigation, fishing, exploitation of economic resources, and other activities.

No one seems to know how the new international agency, envisioned in the Maltese proposals, would affect these activities.

Neither have we been able to ascertain thus far the possible ultimate impact of these proposals on national security undertakings conducted within the marine environment.

D. FINDINGS AND RECOMMENDATIONS

On the basis of the hearings conducted between September 22 and October 31, 1967, the subcommittee finds—

1. That at the present time, the oceans and their potential for sustaining and enriching human life are still largely unknown;

2. That numerous private, national, and international undertakings are currently in progress, aimed at enlarging our knowledge of the oceans and of their resources;

3. That many uncertainties, unresolved questions, and possible conflicts exist in the field of international law and usage relating to the use of the seas and exploitation of ocean resources; and

4. That the proposal to internationalize the seabed and the ocean floor cuts across a broad spectrum of scientific, economic, political, and security considerations, and could profoundly affect the entire structure of private, national, and international marine undertakings.

In view of these facts, the subcommittee believes that it would be precipitate, unwise, and possibly injurious to the objectives which both the United States and the United Nations have in common, to reach a decision at this time regarding a matter which so vitally affects the welfare of future generations.

The subcommittee recommends—

1. That studies referred to in this report, particularly those undertaken pursuant to the United Nations General Assembly resolution of December 1966 and the Marine Resources and Engineering Act of 1966, be pursued to a conclusion;

2. That the U.S. Government actively discourage any action to reach a decision at this time with respect to the vesting of title to the seabed, the ocean floor, or ocean resources, in any existing or new international organization; and

3. That the U.S. Government, while continuing to encourage and support constructive international cooperation in the exploration of the oceans, proceed in this field with the greatest caution so as not to limit or prejudice our national interests in the exploration, use and economic exploitation of ocean resources. The United States should urge further study of all the issues and problems relating to this entire subject.

We are strongly of the opinion that hasty action in this field can create more problems than it will solve or avert.

E. SEPARATE VIEWS OF HON. DONALD M. FRASER AND
HON. BENJAMIN S. ROSENTHAL

We recognize the validity of many of the concerns of the subcommittee. However, we disagree with the negative tone, perhaps inadvertent, with respect to the potential of the United Nations to consider and resolve the issues posed by the preservation, development, and use of the ocean's resources.

Specifically, we believe that the United Nations is the proper assembly for a careful and lengthy consideration of the various national and international issues. The alternative is a continuing haphazard exploitation of the resources of the ocean and its floor to the ultimate detriment of both international cooperation and to an equitable share of what is, by every conceivable standard, a resource common to the nations of the world.

We believe further that legitimate economic development would greatly benefit from a system of international franchises or licenses which could result from international agreement. This would avoid possible future complication arising out of conflicting national claims and uncertain economic investment.

There is no reason to believe that the only alternative to a narrow, national approach is precipitous action by the United Nations. The success demonstrated in negotiating the space treaty is impressive precedent for effective United Nations action. In this earlier treaty, and on numerous other occasions, the United Nations has given adequate and extended consideration to both the complexities of the issues and to national interests.

Finally, we believe the United Nations should be encouraged to consider the possibility of financing its own activities, particularly those involving assistance to the less wealthy countries, from a planned development of the ocean's resources. Whether this possibility could one day solve the United Nations financial problems is not yet known but, once again, the world assembly is the proper forum for exploring the benefits which could flow from such an international approach.

APPENDIX

[United Nations General Assembly, Doc. A/6695, 18 August 1967, Twenty-second session]

REQUEST FOR THE INCLUSION OF A SUPPLEMENTARY ITEM IN THE AGENDA OF THE TWENTY-SECOND SESSION

Declaration and Treaty Concerning the Reservation Exclusively for Peaceful Purposes of the Sea-Bed and of the Ocean Floor, Underlying the Seas Beyond the Limits of Present National Jurisdiction, and the use of Their Resources in the Interests of Mankind

Note verbale dated 17 August 1967 from the Permanent Mission of Malta to the United Nations addressed to the Secretary-General

The Permanent Mission of Malta to the United Nations presents its compliments to the Secretary-General of the United Nations and has the honour to propose under rule 14 of the rules of procedure of the General Assembly the inclusion of the following item in the agenda of the twenty-second session of the General Assembly: "Declaration and treaty concerning the reservation exclusively for peaceful purposes of the sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind".

An explanatory memorandum is attached in accordance with rule 20 of the rules of procedure.

MEMORANDUM

1. The sea-bed and the ocean floor are estimated to constitute approximately five-sevenths of the world's area. The sea-bed and ocean floor, underlying the seas outside present territorial waters and/or the continental shelves, are the only areas of our planet which have not yet been appropriated for national use, because they have been relatively inaccessible and their use for defense purposes or the economic exploitation of their resources was not technologically feasible.

2. In view of rapid progress in the development of new techniques by technologically advanced countries, it is feared that the situation will change and that the sea-bed and the ocean floor, underlying the seas beyond present national jurisdiction, will become progressively and competitively subject to national appropriation and use. This is likely to result in the militarization of the accessible ocean floor through the establishment of fixed military installations and in the exploitation and depletion of resources of immense potential benefit to the world, for the national advantage of technologically developed countries.

3. It is, therefore, considered that the time has come to declare the sea-bed and the ocean floor a common heritage of mankind and that immediate steps should be taken to draft a treaty embodying, *inter alia*, the following principles:

(a) The sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation in any manner whatsoever;

(b) The exploration of the sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be undertaken in a manner consistent with the Principles and Purposes of the Charter of the United Nations;

(c) The use of the sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and their economic exploitation shall be undertaken with the aim of safeguarding the interests of mankind. The net financial benefits derived from the use and exploitation of the sea-bed and of the ocean floor shall be used primarily to promote the development of poor countries;

(d) The sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be reserved exclusively for peaceful purposes in perpetuity.

4. It is believed that the proposed treaty should envisage the creation of an international agency (a) to assume jurisdiction, as a trustee for all countries, over the sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction; (b) to regulate, supervise and control all activities thereon; and (c) to ensure that the activities undertaken conform to the principles and provisions of the proposed treaty.



THE REVISED ITEM PLACED ON THE AGENDA OF THE 22ND GENERAL ASSEMBLY

FIRST COMMITTEE (POLITICAL COMMITTEE)

Item 92. Examination of the question of the reservation exclusively for peaceful purposes of the sea-bed and the ocean floor, and the sub-soil thereof, underlying the high seas beyond the limits of present national jurisdiction, and the use of the resources in the interests of mankind.

THE UNITED NATIONS AND THE ISSUE OF DEEP
OCEAN RESOURCES

HEARINGS
BEFORE THE
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS
OF THE
COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES
NINETIETH CONGRESS
FIRST SESSION

SEPTEMBER 22; OCTOBER 10, 19, 25, AND 31, 1967

Printed for the use of the Committee on Foreign Affairs



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THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

FRIDAY, SEPTEMBER 22, 1967

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS,
Washington, D.C.

The Subcommittee on International Organizations and Movements met at 10 a.m. in room 2255, Rayburn House Office Building, Hon. Dante B. Fascell (chairman of the subcommittee) presiding.

Mr. FASCELL. The subcommittee will come to order, please.

We meet this morning to open hearings on a series of joint resolutions expressing opposition to a premature vesting of title to the ocean floor in the United Nations.

I believe it will be useful to include at this point in the record the text of House Joint Resolution 816, together with a list of similar resolutions and their sponsors. Without objection these documents will be placed in the record at this point.

(H.J. Res. 816 follows:)

[H.J. Res. 816]

JOINT RESOLUTION In opposition to vesting title to the ocean floor in the United Nations

Whereas strong efforts are being exerted by certain groups and individuals to immediately place the United Nations in control of the resources of the bed of the deep ocean beyond the Continental Shelf; and

Whereas our national goals for the development of the ocean floor's resources have not been clearly defined, nor has an approach to the development of these resources been formulated; and

Whereas at present we have only limited understanding of the extent of the undersea resources, the means of obtaining access to them, the conditions for processing and marketing them, and the impact which activities connected with their extraction and mining will have on other uses of the sea; and

Whereas the Congress of the United States in 1966 enacted Public Law 89-454 for the expressed purpose of establishing two official bodies—the National Council on Marine Resources and Engineering Development, and the Commission on Marine Science, Engineering, and Resources—to identify national objectives concerning undersea resources and recommend Federal programs to accomplish these aims; and

Whereas a number of highly responsible national organizations, representing a broad segment of the American public as well as many of the parties interested and experienced in the development of undersea resources have expressed opposition to conferring title at this time to such undersea resources upon the United Nations: Therefore be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That it is the sense of the Congress that any action at this time to vest control of deep ocean resources in an international body would be premature and ill advised; and be it further

Resolved, That the Congress of the United States memorialize the President to instruct American representatives of the United Nations to oppose any action at this time to vest control of the resources of the deep sea beyond the Continental Shelves of the United States.

RESOLUTIONS EXPRESSING OPPOSITION TO VESTING TITLE TO THE OCEAN FLOOR
IN THE UNITED NATIONS*

- H.J. Res. 816—Hon. James A. Byrne, Pa.
H.J. Res. 817—Hon. Frank M. Clark, Pa.
H.J. Res. 818—Hon. Thomas N. Downing, Va.
H.J. Res. 819—Hon. Edward A. Garmatz, Md.
H.J. Res. 820—Hon. Richard T. Hanna, Calif.
H.J. Res. 821—Hon. Henry Helstoski, N.J.
H.J. Res. 822—Hon. Alton Lennon, N.C.
H.J. Res. 823—Hon. Paul G. Rogers, Fla.
H.J. Res. 824—Hon. Ed Reinecke, Calif.
H.J. Res. 828—Hon. Thomas M. Pelly, Wash.
H.J. Res. 829—Hon. James B. Utt, Calif.
H.J. Res. 834—Hon. L. H. Fountain, N.C.
H.J. Res. 835—Hon. H. R. Gross, Iowa
H.J. Res. 837—Hon. Don Fuqua, Fla.
H.J. Res. 840—Hon. Don H. Clausen, Calif.

MR. FASCELL. I know that the subject matter before us has a long history and that its resolution has serious implications for the United States. For this reason I hope that our subcommittee will proceed judiciously in this matter, attempting to obtain as much expert testimony as we can before reaching any decision.

I should like to mention at this point that the folder supplied to each of our subcommittee members contains the major background documents relating to the resolutions before us. These documents include the texts of the resolutions themselves; a statement of the administration's position on the question of U.N. control of the resources of the deep ocean floor; the note issued on August 17 of this year by the permanent delegate of Malta to the United Nations; the resolution on resources of the sea, adopted by the 21st General Assembly of the United Nations;¹ the Convention on the Continental Shelf;² and other papers. As these hearings proceed we will include these various documents in the record.

We have with us a gentleman who has taken an early and long interest in this subject matter and who initiated some of the precepts by which this entire matter came to a head. We are delighted to have him here before the subcommittee this morning to give us his viewpoints. I refer to Congressman Richard T. Hanna, the author of House Joint Resolution 820.

STATEMENT OF HON. RICHARD T. HANNA, A REPRESENTATIVE
IN CONGRESS FROM THE STATE OF CALIFORNIA

MR. HANNA. Thank you, Mr. Chairman and members of the committee. I am grateful for the opportunity to be before you and to give you some of my views pertaining to this very important subject matter that is part of your concern here this morning.

I introduced this resolution, Mr. Chairman, as part of a continuing concern about the law of the sea.

Some two and a half to 3 years ago I introduced in Congress a bill expressing my general concern about the law of the sea and our necessity to put more effort into bringing the law of the sea into juxtaposition with the challenges that the new technology in ocean-

* See also p. 77.

¹ See Appendix, p. 222.

² See Appendix, p. 217.

ography was beginning to develop. I am glad to report that as a result of these efforts, and the testimony before the Oceanographic Subcommittee last year, a statement about the law of the sea was incorporated in the bill that set up the National Oceanographic Council. They are proceeding with some effort in this regard.

However, events outstripped what was stated there in terms of the international scene. Some months ago I became additionally concerned with this matter. This concern arose from several things that happened in sequence.

In 1965, I believe in October, Mr. Roosevelt made a statement for the United States about the seabed and the subsoils of the sea and what the ownership of those should be. I was concerned about interpretation of those remarks.

There have been some meetings held by several bodies here in the United States, one body called the Commission on the Study of the Organization of Peace, and as part of their operation they submitted a report which recommended that this subsurface of the sea be turned over to the United Nations.

Another group, very well known and highly respected, World Peace Through Law, submitted a like proposal that the U.N. should have jurisdiction over the bottoms of the seas.

Then one of the congressional observers to the U.N. recently—

Mr. FASCELL. I think it would be useful if, at this point, we put both documents to which the gentleman refers in the record, that is, the Eichelberger articles and the resolution of the World Peace Through Law Conference.

(The documents referred to follow:)

[Article From the Saturday Review of June 13, 1966]

THE PROMISE OF THE SEAS' BOUNTY—HOW THE OCEANS' ENORMOUS RICHES CAN CONTRIBUTE TO PEACE AND HELP ALLEVIATE WORLD POVERTY—IF THEY ARE PLACED UNDER U.N. ADMINISTRATION NOW

(By Clark M. Eichelberger*)

The last great frontier for natural resources on our planet is the sea. It also may be the richest. Indeed, fragmentary exploration to date indicates that the wealth that ultimately can be obtained from the five-sevenths of the earth's surface covered by the sea may be almost beyond comprehension.

We know, for example, as noted oceanographer Roger Revelle stated in *SR* October 3, 1964, that lying on the deep sea floor are "incredibly large quantities of black, potato-shaped nodules" which contain manganese, cobalt, copper, and nickel whose gross recoverable values are estimated at \$45 to \$100 a ton. We know of nodules in shallow water off Southern California that are thought to contain as much as 60,000,000 tons of phosphatic materials; of titanium-bearing sands believed to occur off Florida, India, Japan, Australia, and elsewhere; of the mining of iron from magnetite-rich sand in shallow waters near Japan (7,000,000 tons of ore were extracted from the floor of Tokyo Bay in just one four-year period); and of diamond-bearing gravels off the southwest coast of Africa that yield about five carats per ton—five times the average in diamond fields inland.

This is only a sampling. But developments to date demonstrate that, unless action is taken soon, the world may face a power struggle for resources of the sea that could equal or exceed the struggle for the resources of Africa and Asia in past centuries. Consequently, almost nine years ago the Commission to Study the Organization of Peace, research affiliate of the United Nations Association of the U.S.A., declared, "With respect to the bed of the high seas beyond the continental shelf and outer space, which are outside the jurisdiction of any state, we urge the

*Clark M. Eichelberger is chairman of the Commission to Study the Organization of Peace, research affiliate of the United Nations Association of the U.S.A.

General Assembly to declare the title of the international community and to establish appropriate administrative arrangements."

In 1961, the U.N. General Assembly, at the suggestion of President Kennedy, took some important steps in this direction in regard to outer space. It declared that "international law, including the charter of the United Nations, applies to outer space and celestial bodies," and that "outer space and celestial bodies are free for exploration and use by all states in conformity with international law and are not subject to national appropriation."

In 1963, the General Assembly further called upon all states "to refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner. . . ." It also adopted a declaration of legal principles for exploration of outer space.

These steps point the way to possible parallel action by the U.N. regarding the sea.

There are compelling reasons for the U.N.'s taking such steps, some of which apply with equal force to the control of man's adventures in outer space. With the population of the world increasing at an explosive rate and with the rapid advance in industrialization, the food supplies and the mineral resources of the sea will be eagerly sought. The majority of nations do not have the technological capability to launch satellites or to gather minerals on the deep sea floor, and many of them cannot compete effectively for the fisheries of the high seas. However, the less advanced should be able to share in these resources as the common property of the world community.

In the absence of clear rights and boundaries, nations will unilaterally attempt to appropriate these areas for their own use. Such claims will reduce the area held in common by the world community and frequently lead to conflicts between nations—as witness the growing number of controversies over fishing rights, and disagreements that have accompanied the appropriation of the atmosphere and the sea for nuclear testing.

Resources such as fish, minerals on the ocean floor and the surface of the ocean, as well as the radio spectrum in outer space can be exploited simultaneously by more than one firm or nation. But under these conditions, exploitation tends to be accompanied by rapid depletion, economic waste, and conflict.

Since the United Nations is not a full-fledged world government how can it persuade nations to accept the proposed regime for the sea?

A sanction may be found where self-interest and the common good coincide. There are, for example, some fishery resources now so depleted that it would be to the self-interest of the few nations involved to agree to international control; and in the Antarctic, depletion of at least one species of whale has threatened that species with extinction. As for the untapped mineral resources of the deep sea, nations might prefer a U.N. regime to an anarchy under which they could not be certain of access.

Through cooperation, nations may actually be able to expand resources of the sea as they could not do themselves. Contrary to popular belief, as Christy and Brooks have said, there are regions of the ocean that are virtual deserts, ". . . regions where the plant nutrients have settled out below the euphotic zone. In such areas, it may be possible to establish artificial upwellings or to improve fertility by other means." Under such circumstances, it would be possible to "herd" fish—the kinds of fish that men prefer to eat. Obviously, no one nation is going to undertake such an effort, but it could be undertaken through the U.N.

The mineral resources of the sea are relatively unknown compared to fishery resources. But the potential wealth in the nodules referred to earlier is well known. At least one boat is being fitted out in the United States to experiment with mining them. Other countries also are interested. However, nations may be reluctant to exploit such mineral resources if they are unsure of title. Further, uncontrolled efforts to extract these resources may disturb conditions in which fish thrive; and might interfere with the Atlantic cables. All are reasons for international ownership and control.

United Nations control also could reduce the danger of pollution. As population grows, man is more and more responsible for, as well as the victim of, the pollution of the atmosphere and water. Unregulated use of the air and the sea will increase the danger of contamination. There is also danger of contamination of the sea by radioactive material, pesticides, and other poisons on land. Contamination of the shared envelope of atmosphere is a matter of concern to all peoples.

Moreover, United Nations' title to operations in the sea could forestall a possible new military race. Without an international agreement, the military of each country may feel compelled on the basis of self-interest to carry defense to any new frontier opened to man. As Navy Commander M. Scott Carpenter said at a recent meeting of aerospace engineers and scientists at Cape Kennedy, "one of the greatest hostile threats to this country might come from beneath the surface of the sea." The Soviet Union, and possibly other countries, may entertain the same fear.

Under the Antarctic Treaty of December 1, 1959, twelve governments, including the United States and the Soviet Union, agreed that Antarctica shall be used for peaceful purposes only. Military personnel or equipment may be used only for scientific research or other peaceful purposes. Thus there is precedent for an agreement, both in this and the U.N. General Assembly action in 1963 calling upon nations to refrain from placing in orbit nuclear weapons or other weapons of mass destruction. (Obviously, this recommendation would not affect the Polaris submarine or present conventional surface military vessels.) Some have suggested, too, that perhaps the U.N. should go a step further and institute a monitoring system to detect and report to the world underseas military activity.

But one of the most challenging reasons for United Nations control and administration of the sea is to provide the U.N. with an independent income. Some member nations now are reluctant to give the U.N. resources adequate even for its immediate, modest program. Despite the authorization of the Security Council for the peacekeeping force in Cyprus, for instance, it is only with the greatest difficulty that, at the end of each three-month period, the Secretary General obtains enough in contributions from individual states to maintain this force. Yet the work of the United Nations must be expanded many-fold if it is to meet the responsibilities than an ever more complex world has thrust upon it, including the great question of disarmament. Nations should not be excused from paying much larger assessments needed to maintain the organization—which to many powers means but a small fraction of their military budgets. However, assessments of the individual members should be greatly augmented by an independent source of income.

For the United Nations to have its own source of income and a vast area to administer would give it the kind of strength and maturity it needs to meet the tremendous problems of the future. Obviously, estimates differ widely as to the income that could be realized from U.N. licensing of resources in the sea and outer space, but the United Nations would gain enormously.

At the same time there would be provided a long-needed source of funds to help underdeveloped areas. Few nations today are in a position individually to exploit resources of the sea, even were there U.N. licensing and control. But if the sea were administered as the common property of mankind, all peoples could share it—for part of the licensing fees charged by the U.N. could be used to assist the nations now most in need of help.

How could all this be accomplished?

The Commission recommends that a specialized agency be created, the United Nations Marine Resources Agency: "This agency should control and administer international marine resources. It should hold ownership rights and grant, lease, or use these rights in accordance with the principles of economic efficiency and the well-being of mankind. It should distribute the returns from such exploitation in accordance with the directives issued by the U.N. General Assembly."

The agency should operate with the efficiency of the International Bank. It must inspire the confidence of those economic interests that would be dependent upon it.

As long ago as 1953, it is interesting to note, in an International Law Commission report to the General Assembly, the possibility of a specialized agency was contemplated, although with a much more limited purpose. Envisaged then was the establishment of an international authority within the framework of the U.N. with the power of adopting binding regulations for protecting the fishing resources of the sea against waste or extermination.

The broadcast of the *Internationale* from Luna 10 in early April indicates how brief the time may be before Soviet and American nationals make a landing on the moon. It points up the urgent need of implementing the 1961 resolution of the General Assembly that the celestial bodies are not subject to national appropriation.

The *New York Times*, in an editorial last April 5, suggested that there should be agreement that the moon is the property of all mankind and open for research

by scientists of all nations. The editorial concluded, "Exploitation of any economic resources found on the moon could well be made a monopoly of the United Nations, with the profits used to finance the U.N.'s peacekeeping, welfare and economic-development activities. The conquest of the moon should serve to bring men together, not to divide them still further or to provide new grounds for conflict."

This is the spirit in which both the riches of the sea, and man's adventure into outer space should be approached. But this spirit can be translated into action for the benefit of all mankind only if we encourage the United Nations to act now, with both the wisdom and foresight that must be applied to the problem.

* * * * *

The Seventeenth Report of the Commission to Study the Organization of Peace, on which this article was based, discusses a number of important recommendations for strengthening world order. They include:

—The United Nations must become truly universal in membership so that all political units may play their parts in a world in which all are bound by law.

—Adjustment must be made between the principle of sovereign equality of states and power.

—The extensive lawmaking process which is now to be found in the United Nations must be expanded so that the General Assembly moves toward becoming a true legislative body in the international sphere.

—Machinery for peacekeeping, peacemaking, and collective security must be augmented.

—Heroic measures must be taken to arrest the growing gap between the developed minority and the undeveloped majority of nations.

—The United Nations' Secretary General must be protected from interference in the great responsibilities and leadership opportunities that have been thrust upon him.

The author wishes publicly to acknowledge the contribution of David B. Brooks and Francis T. Christy, Jr., of the staff of Resources for the Future, who were responsible for much of the material in the study on the resources of the sea, and have been liberally quoted in this article.

The Commission's Seventeenth Report will be the basis of three half-hour programs to be released this fall by National Educational Radio, with assistance from the Johnson Foundation, which also was host to committee members in Racine, Wisconsin, during drafting of the report. Persons interested in obtaining texts of the report should contact the Commission to Study the Organization of Peace, 866 United Nations Plaza, New York City, 10017.—C. M. E.

* * * * *

"This great area covering five-sevenths of the globe contains abundant resources of food and minerals. The sea has been the means of communication by ship. Aggressive war has been waged by surface ships and submarines. Cables have been laid in the sea. Fish have been an important source of food. Man's greed is threatening this source. However, the bed of the sea where great resources are presumed to rest has scarcely been explored. . . .

"Both the sea and outer space involve vast opportunities for weather reporting and communications. Both provide means for transportation and adventure. Both may contribute to our knowledge of how the universe was created. . . .

"In the absence of clear rights and boundaries, nations will unilaterally extend their claims to these shared areas or attempt to appropriate the areas for their own use. Such claims reduce the area held in common by the world and frequently lead to conflicts between nations. The demarcation between areas of national sovereignty and world community rights must be clear. . . .

"No one can estimate now what the income to the United Nations might be from its granting licenses for the exploitation of the resources of the sea and the revenues which should accrue to it from outer space communications. It is estimated, however, that the amount of money to be realized certainly should make an important contribution to the budget of the United Nations. Furthermore, it should help pay for the expanded program of technical assistance to the developing states. In this way nations not technically able to take advantage of explorations and development of the sea and outer space would nevertheless receive some benefit in the form of technical assistance made possible by the exploitation of these common property resources."—*From the Seventeenth Report of the Commission to Study the Organization of Peace.*

[Editorial Appearing in Saturday Review of August 13, 1966]

SHARING THE SEAS' RICHES

"Under no circumstances, we believe, must we ever allow the prospects of rich harvest and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep seas and the ocean bottoms are, and remain, the legacy of all human beings."

These words, uttered by President Johnson on July 13, may be among the most historic of his administration. At stake is five-sevenths of the earth's surface, a vast, unknown area that suddenly could become the prize of a great power struggle.

The voices of power are already being raised. A Soviet scientist said recently: "The nation that first learns to live under the seas will control them and the nation that controls the seas will control the world." And a distinguished American oceanographer said: "The capability of occupying a piece of the deep-sea bed would . . . make the placement of colonies on Antarctica, or even on the moon, pale by comparison."

There comes a moment in history when there is an overwhelming desire or need to penetrate a new frontier. For centuries, man worshipped or feared the celestial bodies. Suddenly, he decided that he must explore them. President Kennedy's proposals adopted by the United Nations General Assembly in 1961 prevented a power struggle to annex celestial bodies; it saved the world from the danger of armed outer-space navies.

For thousands of years, the sea has been a means of communication and warfare, but man has known very little about its depths. Suddenly, there is an overwhelming desire and need to conquer the sea. A considerable part of the world's population is hungry. But within thirty-five years this population will have doubled to 7 billion. It must turn to the vast protein resources of the sea to supplement its food production. As the President points out, so far man has been a hunter for these resources. Now he must be a farmer, preserving and developing them through world cooperation.

Although most of the seas' mineral resources are being explored on the Continental Shelf, untold riches are to be found beyond. As *The New York Times* states, more than 600 companies now are involved in one way or another in probing for the earth's riches.

It was significant that the President made the speech quoted here shortly after he signed the bill entitled, "The Marine Resources and the Engineering Development Act of 1966." This act establishes two bodies: a National Cabinet Council on Marine Resources under the chairmanship of the Vice President, and a national commission to be composed of fifteen citizens drawn from government, industry, and the academic and technical world. These bodies are to recommend an overall plan for an adequate national oceanographic program. So urgent is the need that the commission is charged with producing its report within eighteen months, and the President has asked the Cabinet Council to make preliminary recommendations before the next session of Congress. The President's speech should go far in determining the approach and the philosophy of these two bodies.

The world will not permit a political vacuum. If the resources of the sea are the common property of mankind, machinery must be set up for their orderly exploitation for the benefit of mankind. The President's Scientific Advisory Committee reported that "a cooperative international effort to develop marine resources for the benefit of all humanity seems both logical and appealing."

Here is the challenge to the United Nations. It is essential that it proceed immediately to develop the institutional means for such a program to benefit all humanity. The article, "The Promise of the Seas' Bounty" [*SR*, June 18], urged the establishment of a U.N. specialized agency giving adequate representation to nations with the greatest capability and interests. It proposed that from this program the United Nations have a source of income to be used for a vastly expanded program for the underdeveloped countries.

Developing the resources of the frontier of the sea must not be accompanied by a military race to arm the sea. Daily, there is wide speculation as to the possibility of the two great powers' burying missiles in the sea bed. The nations have agreed by General Assembly resolution and now by treaty that they would not place atomic weapons on space ships. Some similar agreement is needed to prevent a fantastic and costly arms race in the deep sea.

While the Cabinet Committee is forming our nation's program, the United Nations should be formulating the world program. Indeed, the next General Assembly might well announce a set of principles along the line of President Johnson's speech and establish a commission to develop a program for the implementation of these principles.

If President Johnson would make this challenge to the next General Assembly, he would assure that this last earth frontier, the sea—five-sevenths of the earth's surface—would remain the legacy of all human beings—CLARK M. EICHELBERGER.

(Text of resolution adopted by the Geneva World Peace Through Law Conference, July 13, 1967)

RESOLUTION 15: NON-FISHERY RESOURCES OF THE HIGH SEAS

Whereas, new technology and oceanography have revealed the possibility of exploitation of untold resources of the high seas and the bed thereof beyond the continental shelf and more than half of mankind finds itself underprivileged, underfed, and underdeveloped, and the high seas, are the common heritage of all mankind,

Resolved, that the World Peace Through Law Center:

(1) Recommend to the General Assembly of the United Nations the issuance of a proclamation declaring that the non-fishery resources of the high seas, outside the territorial waters of any State, and the bed of the sea beyond the continental shelf, appertain to the United Nations and are subject to its jurisdiction and control.

(2) Refer to its Committee on Fisheries Law the question of conservation and regulation of the international fishery resources of the high seas.

Mr. FRELINGHUYSEN. Mr. Hanna also referred to Mr. Roosevelt's statement at the U.N. This well might be of interest, too. I was at the U.N. as a delegate that fall and I have forgotten the details of what he said but that should be inserted.

Mr. FASCELL. Without objection we shall insert that.

(An extract from Mr. Roosevelt's address follows:)

STATEMENT BY HON. JAMES ROOSEVELT, U.S. REPRESENTATIVE TO THE GENERAL ASSEMBLY, MADE IN COMMITTEE II (ECONOMIC AND FINANCIAL), OCTOBER 15, 1965¹

TOWARD A BETTER LIFE IN LARGER FREEDOM

* * * * *

Cooperation for Undersea Exploration

Mr. Chairman, I have been talking about very specific items presently under active consideration. May I now turn for a moment to an area in which I ask you to join me in the exercise of some imagination. You will forgive me if I say that I come from a long line of innovators who were not afraid to dream.

Whatever benefits mankind is the proper business of this organization which, in the past, has demonstrated not only willingness but great ability to enter previously uncharted paths. I dream, therefore, of the day when this committee will discuss the economic consequences of exploration in areas where man has only begun to probe—under the sea.

I dream of it because the economic consequences will have an important, if not revolutionary, impact upon our procedures and plans for the economic well-being of our planet.

Discoveries in outer space are now but a matter of time, and to the credit of this organization we have a precedent in our resolutions vesting in mankind the benefits to be derived. But a new world is already being discovered without even leaving earth, and what are we doing about it?

I am sure the members of this committee have been reading about the Sealab experiments being conducted by the United States Navy in the waters of the

¹ Extract from address, Source: Department of State Bulletin Vol. LIII, No. 1377, November 15, 1965; see also UN resolution, Appendix, p. 222.

Pacific off the coast of California. These experiments, in which men have lived underwater for as much as a month, are designed to explore and eventually to exploit the oceans' unknown store of food, oil, and mineral resources.

Nor are we in America the only ones to be conducting such experiments. Other nations have also made remarkable progress in this area.

Just as we believe that the assets which may accrue to man from his exploration of outer space should be shared universally, so we believe that what he finds beneath the sea may be used for international benefit without infringing on the sovereign rights of nations.

The supply of marine life, not to mention mineral deposits, deep in the ocean and even near the surface is virtually endless. Learning to use it to feed the hungry, clothe the naked, and even warm the cold could simplify if not solve many of the problems that now concern us and, I would emphasize, may well provide a source of international capital.

It is not too early for this committee to start dreaming and thinking exciting thoughts about the role the U.N. can take. In saying this, I am not unaware that this organization has already demonstrated a sensitivity to the fact that no one nation can hope to attack the many problems posed by the ocean and that a large enough attack can be launched only if all the nations cooperate.

I refer, of course, to the three programs undertaken by UNESCO and its Intergovernmental Oceanographic Commission. The third program, incidentally, has only recently started in the Western Pacific, where 27 ships from 7 countries—China, Korea, Japan, the Philippines, the Soviet Union, the United Kingdom, and the United States—are already participating in the initial phases of the project.

Together with the first two—in the Indian Ocean and the tropical Atlantic—these are vivid proof of the imagination and vision of the membership.

* * * * *

Mr. GROSS. Which Roosevelt was that?

Mr. FRELINGHUYSEN. James, our former colleague.

Mr. HANNA. Then, the next thing in sequence was the speech by the Senator from Idaho who was one of our observers at the U.N. where he made the recommendation that the jurisdiction of the U.N. was the appropriate body—

Mr. FRELINGHUYSEN. I don't want to contradict you, but Members of Congress who go to the U.N. serve as representatives of this country. They are not observers. They are actually part of the delegation, so it is not simply an observer's role. It is a curious role for a legislator because you are representing the executive branch of the Government for a 3-month period.

Mr. HANNA. I had that fine distinction in my mind. It would only have heightened my concern because I was afraid it would be interpreted as an official statement. What you have told me now gives it almost the color of an official statement from a representative of ours to the U.N.

Mr. FRELINGHUYSEN. I don't think any of us there speak as individuals. We speak as representatives of our Government.

Of course, Mr. Popper will have a chance to comment on this. I am glad he is here.

Mr. HANNA. I prepared for the record what I thought would be a counterdialog to the suggestion of Senator Church which I had read in the Congressional Record. I would like at this point to submit for the record my own statements relative to the Frank Church statements.

Mr. FRELINGHUYSEN. Did we already agree that Senator Church's statement could go in?

Mr. FASCELL. Not yet, but without objection we will attempt to get the Senator's statement included in the record at this point.

(The following comment is made in "The United Nations at Twenty-One," Report to the Committee on Foreign Relations, United States Senate, by Senator Frank Church, Idaho, Member of the Delegation to the 21st Session of the General Assembly of the United Nations:)¹

The greatest untapped reservoir of the world's wealth lies, beyond national jurisdiction and under title to no nation, at the bottom of the seas. Mineral riches on the ocean floor may seem of little economic value today. But a generation from now the world's population will have doubled, greatly multiplying the demands on present known deposits of mineral resources. History is replete with incidents of waters bloodied by conflict over the ocean's bounty. Sovereign rights over coastal waters have been a constant source of international controversy. As the population vise tightens, national rivalries for the exploitation of the deep ocean's resources could easily become a new threat to peace.

By conferring title on the United Nations to mineral resources on the ocean floor beyond the Continental Shelf, under an international agreement regulating their development, we might not only remove a coming cause of international friction, but also endow the United Nations with a source for substantial revenue in the future. It should be remembered that the Federal Government of the United States financed much of its operation, for more than a century, through the sale and management of its public lands.

(The remarks of Representative Hanna, appearing in the Congressional Record of August 24, 1967, follow:)

THE LAW AND THE LAND UNDER THE SEA

(By Hon. Richard T. Hanna, of California, in the House of Representatives, Thursday, August 24, 1967)

Mr. HANNA. Mr. Speaker, the enthusiastic romance with the promise and potentials of the "wet frontier" of the world's oceans has continued through the last few years, unabated. On a more practical plane, Government agencies have cautiously extended their activities, sensing a possible explosion of funding for mission-oriented projects. Most impressively, private industry has committed substantial resources toward engineering and scientific projects for meaningful intrusions into the underseas environments. All this has appropriately engendered rising concern over the status of the law of the sea and how, given the underdeveloped condition of this facet of jurisprudence, orderly and effective development and exploitation of the envisioned potentials can be realized.

Viewpoints of concern include our own early observations before the Oceanography Subcommittee over a year ago, when we likened the prevailing lawless conditions in the "wet frontier" to the situation in the early "west frontier." The rule of the six-gun prevailed. The violence of possession gained, being nine points of the law, we were provided with a bloody chapter in our development. To reconstruct that history in the sea in an international scramble for possession and protection would not be appealing. However, to see in this dilemma the necessity for cooperation and mutual assent to some developing rules does not in our judgment dictate an immediate turning to the United Nations, as some have suggested, as the sole forum for an answer. Our attention, as has that of other thoughtful and concerned persons has been drawn to the proposal, most recently expounded by the able Senator from Idaho, Senator Church. We choose to look upon the Senator's suggestion as an invitation for a broad dialog on the problem.

In the hopes of encouraging a continuance of investigation and suggestion, we have set down some thoughts which, in our judgment, question the wisdom of a hasty turn to the United Nations at this juncture in the emerging situation under seas. This is not to say that some role cannot in the early stages be assumed by the United Nations. Nor is it to deny that ultimately, that role may wisely be expanded.

¹ Committee Print, 90th Congress, 1st Session, February, 1967, p. 25, Committee on Foreign Relations, U.S. Senate.

Pragmatically, it strikes us that the more productive approach would be in limited stages, closely associated with practical problems as they occur, and the gradual working out of problems of cooperation within a framework of internationally binding law.

During the period in which modern international law evolved, the bed of the sea and its subsoil were technologically inaccessible. As a result, no specific doctrine was developed as to ownership and exploitation of submerged areas. Whether the exercise of sovereignty over the territorial seas and contiguous zones included a like or lesser control of the subsoil and seabed was not a matter of practical or legal importance.

Unilateral action regarding sponges and pearls—in areas called fisheries—represented the initial attempt to control areas of seabed. In English jurisprudence, the isolated incidents of litigation and subsoil rights were brought by the Crown as a result of the extension of mine shafts beneath territorial seas.

Nonetheless, two general principles have evolved which could be applied. One is the Roman doctrine of *res communis*, or common to all. This has provided the basis for the generally accepted doctrine of freedom of the seas. Institutions of this doctrine would prevent any establishment of national sovereignty. The second doctrine is that of *res nullius*, or belonging to none. Such a doctrine would permit the acquisition and extension of sovereignty into such areas as were not already occupied. The two doctrines, of course, are incompatible.

It has been only recently, when modern technology has made it feasible and profitable to drill oil wells into the subsoil, and when projections of future interrelated demands for energy, water, and minerals from the sea have been established, that the importance of ownership of the seabed and subsoil has become fully recognized.

In 1945, President Harry Truman issued a landmark proclamation in which he expressed the view that—

“The exercise of jurisdiction over the natural resources of the subsoil and seabed of the Continental Shelf by the contiguous Nation is reasonable and just.”

And proclaimed further:

“The Government of the United States regards the natural resources of the subsoil and seabed of the Continental Shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States (and) subject to its jurisdiction and control.”

This, however, could be explained as a domestic matter in the historic sense. Soon, however, in light of the new technological capabilities, it became necessary to extend the width of territorial waters and to establish contiguous zones, formerly regarded as high seas areas.

As a result, the Convention on the Continental Shelf attempted to establish a method for national control over the seabed and subsoil of the Continental Shelf, so that sovereignty over the superjacent waters would not be extended. Unfortunately, the Convention adopted a double standard for establishing the limits within which the coastal state may exercise “sovereign rights for the purpose of exploring and exploiting” the Continental Shelf. The first article of the Convention provides that—

“The term ‘continental shelf’ is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands.”

And the second article then declares that—

“1. The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources.

“2. The rights referred to in paragraph one of this article are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities, or make a claim to the continental shelf, without the express consent of the coastal State.

“3. The rights of the coastal State over the continental shelf do not depend on occupation, effective or national or on any express proclamation.”

The implications of this doctrine present numerous problems in international law of the sea. What remains unclear is the outer boundary of this exclusive area. What if the seabed has deep trenches in it? Does the coastal jurisdiction revive farther at sea? Under part (a) of article I, cannot one state just keep going, out into the sea up to the point where another state makes a similar claim? And then,

where are we left? Furthermore, what about the area beyond the coastal state's jurisdiction, what regime rules here? Does *res nullius* or *res communis* apply? It would seem that in reality, the only limit is that which is measured by the criterion of exploitability.

There is a growing concern that somewhere in the near future a few oceanographic powers will be able to occupy and thus appropriate all the deep ocean mineral areas that could be developed for some time.

Recently, President Johnson called attention to these dangers in his remarks at the commissioning of the new research ship *Oceanographer*:

"Under no circumstances, must we ever allow the prospect of rich harvest and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep and the ocean bottoms are, and remain, the legacy of all human beings."

Clearly, we are now faced with some fundamental decisions about rights and uses of the lands beneath the sea. Pressures for making the decisions are mounting daily.

In a paper prepared for the American Bar Association National Institute on Maritime Resources, Mr. Frances T. Christy, Jr., outlined the criteria for the establishment of a useful regime over the sea. In part, he stated:

"In considering the alternative regimes, the basic objective is to arrive at that regime that will be viable over the long-run and that will encourage the economically efficient, peaceful, and orderly exploitation of the minerals of the sea floor, its success will be measured against three criteria. First, it must permit economically efficient operation. Second it must be acceptable to a sufficient number of nations both in the long and the short run. And third, it must be feasible."

In the United States, the Commission to Study the Organization of Peace, in its 17th report, dated May 1966, presented its arguments for the proposal that—

"With respect to the bed of the high seas beyond the continental shelf and to outer space, which are outside the jurisdiction of any state, we urge the General Assembly to declare the title of the international community and to establish appropriate administrative arrangements."

With the United Nations owning and licensing for exploitation the sea floor minerals, the income would naturally flow into the U.N.

And, on February 15, 1967, Senator FRANK CHURCH proposed that—

"By conferring title on the United Nations to mineral resources on the ocean floor beyond the Continental Shelf, under an international agreement regulating their development, we might not only remove a coming cause of international friction, but also endow the United Nations with a source for substantial revenue in the future."

On the surface, we suppose, this may seem to be a most logical, necessary, and simple proposition. But a more than cursory look at the implications of such a move would reveal some of the numerous problems which arise.

The U.N. would have to acquire jurisdiction over resources on and under the sea floor in order to permit it to grant and protect exclusive rights of entrepreneurship and to withhold areas from exploration and development perhaps for the use of missile ranges and such. Would allocations be made to nations or to individual developers? In addition it would have to have the power to tax or extract rent or royalty payments for the use of the resources. It would also have to be granted the ability to utilize or distribute these revenues in an acceptable manner and boundaries for its own jurisdiction would have to be established. Probably some scheme would have to be enforced whereby the interest of the adjacent coastal states would be recognized and perhaps they would split royalties with the U.N. Some equitable method for doing so would have to be found. Perhaps the closer the exploitation to the shore of the state, the greater its share of the royalties. Some form of a bidding mechanism would be necessary to insure efficient and fair allocation of the rights of exploitability.

Many other controls would have to be established. Definite time limits for performance of the required exploration and exploitation would be necessary, as would some form of inspection to insure that the requirements of the lease were being upheld, that maximum care was being taken to insure that the marine environment was not being damaged, and that the resources were being used efficiently.

Administratively, the placing of jurisdiction over the sea in the hands of a group such as the United Nations poses numerous other problems. Initially, we must ask, where a qualified staff would be found. How could they determine the size of a possible lease, the duration or terms of renewal, the royalties or taxes

which should be applied, the method of awarding concessions to competing groups, the amount and nature of control of production and prices, and effectively establish and enforce the controls and requirements previously enumerated as well as those yet unnamed, except on an extremely arbitrary basis? With a questionable degree of urgency, should we not be sure that we are on solid ground before committing ourselves to a position we might later regret?

It has been pointed out that a great deal of money is required for deep sea mineral exploration, but even more will be necessary for production. Only a few very large companies, and a few national governments have the necessary risk capital readily available. Of the 135 national states in the world, 109 border on the sea, but the governments likely to be involved in undersea operations of this nature number no more than a dozen if we take into consideration the factors of financial capacity, maritime experience and undersea technology. But, these are the very same nations with important military and strategic interests in the sea. In the past they have not found it necessary or expedient to ask permission from the United Nations to carry out their undersea operations. In the future, it is doubtful that they are going to find it necessary or desirable to ask the U.N. for permission to carry out their mineral explorations.

Furthermore, these are the very same nations which have veto powers in the Security Council and extraordinary bargaining powers in the General Assembly.

Then again, it is rather inconceivable that nations large or small would concede taxes and royalty rights, previously under their own jurisdiction to a non-sovereign agency for the granting of a right which it only obtained power to grant because these nations elected to create such a device. The United Nations' primary function is that of a mediator, not a sovereign. Nor would many nations be ready to accept a proposal which would permit emplacement of foreign controlled structures near their coasts. Many coastal nations would undoubtedly have to yield rights previously asserted. The United States, for example, has granted a phosphate lease some 40 miles from the coast of California in 240 to 4,000 feet of water.

Furthermore, even despite inspection controls, many states would naturally be apprehensive about positioning structures, under foreign control, near their shores, because of potential interference with navigation, fishing, recreation, submarine pipelines and cables, and military exercises. Such structures would be potential bases for covert espionage and military purposes, as well as potential producers of pollutants which would eventually reach the adjacent shores.

We readily doubt that we are at an appropriate stage in ocean development for the establishment of detailed rules and principles for allocating and regulating the use of the ocean. Our view of the future is rather dimly perceived. There are an infinite number of varied possibilities in the field of adapting the ocean to human benefit. While we can hope to prepare for dealing with a variety of possibilities, and attempt to make extremely flexible, tentative, resolutions for anticipated problems, we cannot be nearly as optimistic if we seek to definitively resolve problems now which are hard to define except in the most general of terms. Can we effectively formulate rules for the exploration and exploitation of resources before we know what and where these resources are? Thus allocation of sovereignty to an international community should be considered a bit premature at this time.

Our present knowledge of the future of drilling and production technology is similarly limited. We really have very little knowledge of what the state of such machinery, and the problems they could conceivably present in the near future are or what their course of development would be. Due to this unpredictable technological timetable and in the name of efficiency, and to avoid unnecessary restraints on efficient equipment should we not wait until we are more familiar with technology before adopting treaty principles?

As far as the need for providing a source of income for the United Nations is concerned, a number of points should be made. If the world powers, whose assent would be a prerequisite to a plan to turn the ocean floor over to the U.N., desired to support that organization wholeheartedly, they certainly could do so without resorting to the sea at this stage in time. Certainly a restructuring of the General Assembly would be a necessary requirement before the major powers would agree to permit it to dispose of large amounts of money obtained independent of their control, but in reality, at their expense. Current political realities make this a necessity.

Certainly, the U.N. presently has enough administrative problems with which to deal. It can ill afford additional burdens at this point. It has recently become all too evident that the U.N. has a long way to go in its maturation process.

Doubts must be raised to the U.N. plan with respect to two of the three listed criteria: acceptability and feasibility.

The rather dramatic and immediate demonstration of how more effective international and regional programs can play in the exploitation of the ocean bed can be seen in the arrangements now being worked out for the extrication of gas from under the North Sea.

By the multilateral determination of the interested countries along general principles offshore ownership of the gas and other mineral deposits under the North Sea have been extended along a median in that body of water. The median lies between two masses of land and is supplemented by unilateral agreements on the actual division line of arc segments coming from sovereign coasts. Because of this, understandings are emerging which make a peaceful, productive and equitable solution to the North Sea problem appear imminent.

The thrust of our argument questioned whether having this matter within the jurisdiction of the United Nations would have unscrambled this situation in any where near the time frame than this more practical handling was able to, nor could we predict that United Nations handling would have provided any more equity than that which was worked out on a regional basis.

There are broad ramifications that can make a very definite contribution to the emerging patterns of the body of law relating to the resources of the sea where competing national interests impinge one upon the other. The North Sea experience suggests positive ramifications.

A large portion of the law will have to come into being based upon practical experiences similar to that resulting from the North Sea situation where the benefits of cooperation easily outweigh the benefits which may accrue from an antagonistic and aggressive posture.

The world's existing mineral laws, operating above the sea have evolved in an orderly manner from centuries of struggle with problems far less complex than these. Together with a maturation of the U.N., we ought to look toward a maturation of the law of the sea, before burdening it with additional, and perhaps naive codes. It would be wise to let the scientists precede the lawyers in this field. Case law seems far more practical than codes prefabricated in an unknowledgeable vacuum.

The issues are highly complex, the political dangers great, and the economic consequences potentially enormous. A great degree of caution is vitally necessary.

Mr. GROSS. What is Senator Church's position?

Mr. HANNA. He favored, in the remarks that I refer to, the proposition that the U.N. was the proper body to have jurisdiction over the seabed of the high seas and the subsoils thereof.

I take, at least from the timeliness standpoint, the opposite position, that the U.N. is not the proper jurisdiction at this time.

You know now my concern. When I heard about the Malta move by Ambassador Pardo, that was the end of the line as far as this was concerned. It seemed to be moving toward an actual determination of a matter which I felt was not in a position to be determined at this time.

When I learned of the Malta resolution, and that it was coming up so quickly, it seemed to me appropriate that something should be activated to bring everybody's attention to what was going on. I felt there had been too much of a dominance in the center stage, so to speak, of a viewpoint that made it appear as if the United States entertained an affirmative attitude.

Mr. FRELINGHUYSEN. As I understand Mr. Hanna, your resolution was introduced after you had news that Malta was planning to introduce a resolution at this session of the General Assembly?

Mr. HANNA. Yes, As a matter of fact, if you read the timing on the thing it was after the resolution had actually been introduced. It did not come to my attention at the time when it was introduced, so I got it after it was introduced but before it was to be considered because, as I understood the timing for consideration, it would have come up this week had not other matters preempted the original plan.

Mr. FASCELL. I think we should clarify the record at this point.

As I understand it, what Malta has submitted, is a request to the Secretary General for an item to be placed on the agenda. The actual resolution itself has not been presented yet.

Mr. POPPER. An explanatory memorandum was presented.

Mr. HANNA. I think that is correct. It is in the nature of a request. The request carried the explanatory memorandum.

Mr. FASCELL. At this point without objection, Mr. Hanna, we shall place the request of Malta with the explanatory memorandum in the record.

(The information is as follows:)

REQUEST FOR THE INCLUSION OF A SUPPLEMENTARY ITEM IN THE AGENDA OF THE
TWENTY-SECOND SESSION, AUGUST 18, 1967¹

DECLARATION AND TREATY CONCERNING THE RESERVATION EXCLUSIVELY FOR
PEACEFUL PURPOSES OF THE SEA-BED AND OF THE OCEAN FLOOR, UNDERLYING
THE SEAS BEYOND THE LIMITS OF PRESENT NATIONAL JURISDICTION, AND THE
USE OF THEIR RESOURCES IN THE INTERESTS OF MANKIND

Note verbale dated 17 August 1967 from the Permanent Mission of Malta to the United Nations addressed to the Secretary-General:

The Permanent Mission of Malta to the United Nations presents its compliments to the Secretary-General of the United Nations and has the honour to propose under rule 14 of the rules of procedure of the General Assembly the inclusion of the following item in the agenda of the twenty-second session of the General Assembly: "Declaration and treaty concerning the reservation exclusively for peaceful purposes of the sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind".

An explanatory memorandum is attached in accordance with rule 20 of the rules of procedure.

MEMORANDUM

1. The sea-bed and the ocean floor are estimated to constitute approximately five-sevenths of the world's area. The sea-bed and ocean floor, underlying the seas outside present territorial waters and/or the continental shelves, are the only areas of our planet which have not yet been appropriated for national use, because they have been relatively inaccessible and their use for defence purposes or the economic exploitation of their resources was not technologically feasible.

2. In view of rapid progress in the development of new techniques by technologically advanced countries, it is feared that the situation will change and that the sea-bed and the ocean floor, underlying the seas beyond present national jurisdiction, will become progressively and competitively subject to national appropriation and use. This is likely to result in the militarization of the accessible ocean floor through the establishment of fixed military installations and in the exploitation and depletion of resources of immense potential benefit to the world, for the national advantage of technologically developed countries.

3. It is, therefore, considered that the time has come to declare the sea-bed and the ocean floor a common heritage of mankind and that immediate steps should be taken to draft a treaty embodying, *inter alia*, the following principles:

(a) The sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation in any manner whatsoever;

(b) The exploration of the sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be undertaken in a manner consistent with the Principles and Purposes of the Charter of the United Nations;

(c) The use of the sea-bed and of the ocean floor underlying the seas beyond the limits of present national jurisdiction, and their economic exploitation shall be undertaken with the aim of safeguarding the interests of mankind. The net financial benefits derived from the use and exploitation of the

¹ United Nations General Assembly, 22d session, Document A/6695.

sea-bed and of the ocean floor shall be used primarily to promote the development of poor countries;

(d) The sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, shall be reserved exclusively for peaceful purposes in perpetuity.

4. It is believed that the proposed treaty should envisage the creation of an international agency (a) to assume jurisdiction, as a trustee for all countries, over the sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction; (b) to regulate, supervise and control activities thereon; and (c) to ensure that the activities undertaken conform to the principles and provisions of the proposed treaty.

Mr. HANNA. If you turn your attention to that memorandum I suggest that what Malta is proposing falls into three categories. The first category is that of a general statement, a very broad statement; that for the benefit of all mankind the jurisdiction of the seabed should be vested in the United Nations.

The second section sets up actual mechanics as to how they feel this jurisdiction should be exercised in terms of extending some kind of rights to exploitation, and the third section of it determines what shall be done with the income to be derived out of extending the rights to exploitation, so this is a rather far-reaching proposal, going as it does in these three directions. It seems to me implicit instructions which then limit, very materially, the options for alternatives that history of the development of oceanography might dictate.

When you look at what they have proposed, and critically analyze what that means to the United States, I think you would have to look at it in this way:

First of all, what is the body to which this matter is referred? How is it made up? What are you likely to read out of this body?

Well, in this connection you have to classify the nations in four categories. Those four categories would be as follows:

The naval power nations, the maritime nations, the seaboard nations, and the landlocked nations.

Out of those four categories you would get a difference of attitude, a difference of posture relative to what will happen in the deep seas. They are very greatly divergent interests that come out of those categories.

There are 109 nations in the world which have some contiguity to the sea.

At last count I think we have some 132 sovereignties in the world. That is subject to correction, but it moves so fast nowadays it is hard to keep it in mind. I hear that one of our nations is splitting up and making three new nations this next month.

However, if you take into consideration that at least there are portions of nations that have no contiguity to the sea, anything that would give them an interest in the sea is to be desired as against what is now their case.

If you look at the distinction between those nations which have contiguity to the sea and those nations which are naval powers you reduce it down to a handful. Now you are talking about perhaps nine nations. To those nations it would be important to them that the concept of freedom of the seas be very broad so they can move their forces rather freely.

If you move into the category of maritime nations now perhaps you talk about a little more than a handful but certainly no more than a clutch, say 29 or 30 nations, which have an active interest in maritime

fleets, and here again they are more interested in a philosophy of the openness of the sea.

When you then come down to those who are only contiguous to the sea you will see that they are of the larger number when taken with the landlocked nations and those in the two top categories of the naval powers which also include the maritime powers.

It seems to me that it is important to realize that these are the largest and richest nations in the world and therefore have the capital that is required to make the exploitation of the sea in the first instance. They are the ones that have the money to do this.

Mr. FRELINGHUYSEN. Are we talking about the contiguous nations or the naval powers or the maritime powers?

Mr. HANNA. If you take the naval powers and the maritime powers, and all the naval powers are maritime powers so these two categories come together, these are the nations that have the money to do the exploiting in the sea. The rest of the nations do not have and they are the majority of the nations. They do not have the money.

Mr. FRASER. On the matter of exploitation you mean fishing rights?

Mr. HANNA. I am thinking more, if I might make this distinction because it is important, in terms of developing the technologies that will allow the exploitation of the seabeds. I think you would have to distinguish in this dialog not only the distinction between the nations that would make up the determination if you put it in the U.N. but also a distinction in what part of the sea you are talking about—the surface of the sea, the body of the sea, or the bed and subsoil of the sea. These are three very definite distinctions.

Mr. FASCELL. You will have other criteria, also. That includes the resources themselves.

Mr. HANNA. Exactly. It depends upon what the technology within given resources are because oil technology is moving ahead of, say, mining technology in the sea.

In each of these instances I think it is important to realize that nothing will happen out there without a large capital outlay in term of moving ahead in actual accomplishment of exploitation in the sea.

One of my major concerns is that it would not be good for any nation if we made a decision that would put a damper on the utilization of your resources to exploit the sea.

This is very clearly indicated in one of the documents you referred to, Mr. Chairman, and that is in the recent determinations on the continental shelf, in the international convention which was held relative to the continental shelf, because they define the continental shelf as that seabed adjacent to a national shoreline 200 meters in depth or exploitable under the existing technology; so that the 200-meter depth was only one of the criteria, and the other was as to the reality of exploitability so that if there was a demonstrated ability to exploit—and you will have in your records this statement of the Convention on the Continental Shelf—it will indicate to you clearly that both of these things were in their definition.

Mr. FRELINGHUYSEN. Whose definition is this? Who adopted it?

Mr. HANNA. This was adopted—

Mr. FASCELL. If the gentleman will yield, it is the Law of the Sea: Convention on the Continental Shelf; between the United States of America and other governments done at Geneva, April 29, 1958. It went into effect on June 10, 1964.¹

¹ For text, see appendix, p. 217.

Mr. HANNA. I think you should very carefully read this because this indicates that already an international body has determined what the jurisdiction of any nation would be that has contiguity to the sea. In one interpretation of what they said it goes out as far as they are able to exploit. If you take out of it what they mean when they say "adjacent," which is a term that can be defined in a number of different ways, then the exploitability would mean that in any body of water you would exploit out until you met somebody coming your way who was exploiting from another shore, and at that point I suppose you would have determined who could exploit what.

It seems to me this indicates that there is a concern of moving out into the sea in a pace with what is feasible in terms of exploitation. This particular convention may not be the last stop, and I certainly don't expect it to be, but it indicates to us that there has been some thinking about tying together our consideration of the law of the sea with what is really the feasible exploitation potential of the sea.

If you make the great leap forward and determine in an abstract way what you are going to do about something which you don't know whether is exploitable or not you will put a damper on the exploitation itself, and this will not be helpful to anybody because the resources will be meaningful to the inventory of mankind only if they are extracted. The fact they are out there means nothing. It is only when they are extractable that they then become part of the inventory of mankind, so I suggest a decision should not be made which would put a damper upon their being extracted.

It seems to me that if we move the alternative I would suggest, gentlemen, and I think you must have an alternative here, it is that we encourage cooperation. We certainly support the United Nations studies in these fields, and maybe the setup of a committee such as we have in space to assist in the cooperation. Until we have a better picture as to what the exploitative feasibility is within a developed technology that we not start talking about turning over sovereignty.

Myself, I am firmly convinced that up to now the United Nations has demonstrated that it is only an institution that can practically carry negotiations and resolutions of disputes. This is a far cry from having those ingredients which are required when you attempt to wield sovereignty.

Mr. FRELINGHUYSEN. This Convention on the Continental Shelf was under U.N. auspices. You are not arguing against a role for the U.N. in future developments in this area? It is a question of timeliness, and the relationship of what has been done to what might be done?

Mr. HANNA. In fact, what I am suggesting is that the U.N. continue in this manner in which it brings together the nations which are really involved. You will find the nations who signed this convention are the nations that are in this clutch, which I talked about, which have the resources which can be applied to the extraction of the resources of the sea, and they are moving ahead.

The cooperation between these nations should be maintained. I think our attitude toward the law of the sea should continue to be that of offering prescriptive rights to those who can get out and show that they can actually develop an extracting potential and then take to a mediation point how you are going to resolve the possible frictions between the states.

A classic example of how this is working out is now available to this committee if you will read what is happening in the North Sea about the extraction of the gas potential there. It seems to me this is the pattern of today's approach. It may not be tomorrow's approach, but today's approach should be to follow out how we can encourage nations to sit down, have a forum in which they can work out a conference agreement, a treaty agreement in which there is an absence then of violent confrontation; rather set up a forum and build on a case-by-case basis some kind of principles which can then be applied on a grander scale.

Right now I just don't think we have those principles worked out, and it would be a grave mistake, it seems to me, to go ahead with this. Actually I am delighted to find that it is the position of the United States that we do not support at this time this suggestion by Malta that the sovereignty of the seabed and subsoils of the outer oceans be turned over to the U.N. Rather, I think, if I understand what I have been told most recently, that our position will be to encourage further studies and to encourage perhaps a committee to be set up to work on outer oceans as we do outer space with encouragement for forums in which the interested nations can cooperatively go into the exploitation and develop with an availability to all who come the expertise to go out and participate.

When these resources start to be realized perhaps, then we would want to look out and ask how do we equitably distribute the great resources of the sea. We know only of their potential at this point.

I remember there was an old Pennsylvania Dutch recipe for wild turkey which very much impressed me because at the top of the recipe it says: "First get the turkey."

It seems to me that if you are talking about stuffing it and seasoning it and cooking it, when you haven't even got it you miss the very first important line in the recipe—first get the turkey. I think that is my concern here.

My suggestion is that we haven't yet got the turkey.

Mr. FASCELL. Thank you very much, Congressman Hanna.

Mr. Fraser?

Mr. FRASER. I want to commend our colleague from California for a very forthright and sensible statement.

One of the concerns that I am sure is in the minds of some people who think about these kinds of problems is that sometimes if you wait a while and see what develops by way of the enlarging capacity of our technology and the working out of binational and multinational agreements with respect to the rights and benefits, that the situation may move along to a point where it then becomes increasingly difficult to move away from the preemptive national acquisitions.

Take the problem of the moon, for example. It would have been a problem had we waited until the Soviet Union and the United States made claims and acquired prescriptive interests, and then the idea had come up that the U.N. might enter the picture.

I agree with your assertion that national powers such as the United States and other developed nations are likely to be the source of this enlarging technology and the capital required to implement it. I had not supposed, however, that if some day the United Nations were to acquire the title or the right to decide who can exploit this, that this

would limit the capacity of the United Nations to say to the United States or to Great Britain or to Japan that they could exploit under a license or to give a license to some private concern.

In other words, is it really a limitation on the possibility of exploitation that the original grant of authority should stem from some kind of international body rather than from some national body? In any event it finally comes down to men and machines, and so on. It may be under private control, it may be under some kind of quasi-governmental control, under national control, or conceivably it could be contracted for directly by an international body.

I raise this only in a discussion sense. I don't take a definitive position.

I will add a final comment here and this would end my question.

When I was at the U.N. last week I had the impression that the introduction by Malta of this request was seen in the U.N. as the beginning of a very long process of precisely the kind you are describing. In other words, this is the first step in a 1,000-mile journey. It was not thought there was about to be a vote to finally dispose of the ocean beds in the world but this was the beginning of opening the subject to these very kinds of discussions which you properly described. These things are very important and should be worked out.

Mr. HANNA. Let me see whether I can make some kind of comment at least in answer to what I think you asked. First of all, would you rephrase the first part of your thinking as a question so I can be sure I am addressing myself to it?

Mr. FRASER. The two questions are these: Does exploitation have to come under national supervision? Does that have to be a source of authority or the source of license? The other question was, what about the problem if you wait too long, so there is an assertion of national interest throughout the world so that you might then put it beyond the reach of an international body?

Mr. HANNA. I think this is the kind of thing that occurs many times in decisionmaking in a legislative body. There are buy-offs in whatever kind of decision you make. It is a mistake to believe that you have to do one thing or else the other.

I often think of an old Irish friend of mine, Mickey Moltehill. He came in one day muttering from the roundhouse.

I said: "What is the trouble, Mike?" He said, "It is the blather-skite at the roundhouse. He is always giving me a bad time. He says to me today: 'Mike, you either do this or else.'"

He says, "You know what I told him. I'll take 'else'. She's not such a bad old girl."

It seems to me whenever you present somebody with either do this or else, they are likely to take else and that is not in your best interest. It is therefore best to avoid putting things in those alternatives. I think there are a number of alternatives. One is that you set through the U.N., perhaps, guidelines as to how the nations should act in a period of time of emergence of the exploitation and the penetrations.

Mr. FRASER. So there might be an evolutionary role?

Mr. HANNA. Yes, an evolutionary role in the U.N. They could be an adviser and forum to take care of individual disputes as they occur but not be the final decisionmaker as to what the pattern of emergence will be, because I think that is best left to the process itself. That is the answer to the first question.

The second question is as to whether or not we will deny national exploitation by putting it in the U.N. I certainly don't take that position. However, I think there is a dampening that will occur because the necessary mechanisms that must derive and the handling of the kinds of problems that immediately come to mind do not lend themselves to solutions within what now is the U.N.

I think, in terms of this point I brought up to you about the distinction of the areas of the sea—bed of the sea, surface of the sea, and so on—these are not divisible although they might be in our minds. Actually they are not divisible.

You put a structure at the bottom of the sea. What are you doing? You are penetrating the body of the sea with that structure.

Now you get into questions of overflight by a submarine coming over somebody who has something on the bed of the sea just as you get questions of overflight on land when you put up a structure. These kinds of problems have not yet been thoroughly investigated so that you cannot turn over at too early a stage a determination of what will happen at the bed of the sea when you know you immediately will be involved with what happens in the body of the sea, and, perhaps because it must have some lifeline to the upper air, what happens on the surface of the sea.

Until these things are carefully thought out and how they interrelate, I suggest we are in no position to turn over sovereignty to anybody.

This is the important part of your second question.

Mr. FRASER. You are not necessarily asserting that the right course to follow is that there should be national preemption of such beds as technology will make available. What you are saying is that this whole question needs to be studied.

Mr. HANNA. Exactly.

Mr. FRASER. You think the U.N. has an important role to play as the dialog unfolds.

Mr. HANNA. Exactly, and they should not try to unfold it any quicker than it does unfold of its own machinations. To try to deal with this in the abstract is only to lay up headaches when the abstract becomes concrete in an entirely different form than the abstraction indicated it was going to be. Most of the time that is true about abstractions; they just don't turn out that way.

Mr. FRASER. Thank you, Mr. Chairman.

I again want to express my appreciation to our colleague. I think he is helping to stimulate what I hope will be a very constructive discussion of this whole problem.

Mr. FASCELL. I would like the record to indicate that because of the intense interest in this matter we have been joined by a member of this subcommittee who is also serving at present as a member of the United States Delegation to the 22d Session of the of the U.N. General Assembly. I am referring to our colleague, the Honorable L. H. Fountain. We are delighted to have him here. We know of his great interest in this subject. We are also extremely pleased to have the ranking minority member of the full committee, who is always very interested in the matters coming before this committee. We are delighted to have Mrs. Bolton of Ohio here this morning.

As ranking minority member of the subcommittee, we will allow her to ask questions if she wishes at this point.

Mrs. BOLTON. May I suggest you follow the usual procedure in the regular committee?

Mr. FASCELL. Mr. Gross.

Mr. GROSS. As a landlocked country boy trying to get along in Washington, I have a lot to learn about this business.

Does the gentleman have any idea why this thing originated with the Malta delegation to the United Nations? That is just a chunk of rock out in the Mediterranean. What prompted the Maltese?

Mr. HANNA. I can only surmise what was behind that move, Mr. Gross, but let me suggest this, that those of us who watch what is happening on the world scene can predict in the future that for the small nations there are only two routes to follow. You either have to become federated in some kind of a viable economic relationship or you have to find some special *raison d'être*, such as the Kingdom of Monaco where they have gambling to support themselves.

This bears directly on Malta. Malta sees itself peculiarly situated to become a central focal point for oceanographic activities and particularly in that portion of the world's oceans in which it is located and this may well become the very special reason why Malta continues to be a separate entity. Looking into the future, it is quite possible that the leadership of Malta in general, and Mr. Pardo in particular, sees by moving out here and taking this front position that he is already carrying out a domain, a special reason for the existence of Malta as a nation.

Mr. GROSS. Would they perhaps be following through for the British in some enterprise?

Mr. HANNA. I wouldn't care to extend my surmising into such machinations, but I suppose if one were of a critical frame of mind——

Mr. GROSS. You mean suspicious frame of mind.

Mr. HANNA. I suppose that word could be used also. But I really think, basically, they have a feeling that they would become one of the laboratory centers in oceanography and they want to bring attention to the fact that they are moving in the forefront of this. Perhaps logically they are looking to their old associate, Great Britain.

Mr. GROSS. I will say to the gentleman that I have been around here for some time, as has Mrs. Bolton. We went through the offshore oil fight in Congress. That has been a few years ago. I suspect that before we get through with this I will have a few comparisons to make with—I don't want to raise the issue at this time—with the offshore oil legislation.

May I ask one question——

Mr. HANNA. May I make this comment on what you have said, Mr. Gross: I was a great admirer of French detective stories and I remember one particular writer who always used to say, "*Cherchez la femme*." Find the woman and you will find the solution to the crime.

I have noted in the detective stories around here that you have always been the man to "*cherchez le buck*" and I have been equally impressed by your stories in that regard.

Mr. GROSS. Not being a student of French, I don't know whether to accept that as a compliment or not.

Mr. HANNA. It is, believe me.

Mr. GROSS. In this case I will do so, and thank you.

What is the gentleman's opinion of the Geneva Convention? Was that an entering wedge?

Mr. HANNA. That actually was a continuum of an attempt to protect what the national interests of the active seacoast nations were with regard to the continental shelf. Probably if the United Nations stays at the status quo, you will see there will be in 1969 another meeting of this group with a follow-on convention which was anticipated at the end of the one which made this report, to further consider how they would better refine their agreement. Myself, I think that would make a great contribution. I hope that process will continue.

Mr. GROSS. Thank you, Mr. Chairman.

Mr. FASCELL. Isn't it true, though, since we do have a convention affecting the continental shelf and the rights of the coastal states, that any attempt at any action in the United Nations would have to take into consideration the existing convention?

Mr. HANNA. Well, that is really true. Of course, one of the very embarrassing situations there—

Mr. FASCELL. The reason I was raising the question is that I appreciate your concern, but I can't quite relate it to the situation at hand. I don't see how the U.N. could act in the face of a convention. I don't see how the members themselves could contravene a convention which just went into effect in 1964. I agree, however, that it might be premature at this point to explore a declaration by all of the nations of the world on a subject upon which the coastal states have already acted.

Mr. HANNA. It would be probably a more manageable situation if, in handling their own matters, they had open ended the definition of the continental shelf.

Mr. FASCELL. You mean if they had affixed an actual limit?

Mr. HANNA. That is right. That hasn't been done.

Mr. FASCELL. The only trouble with that is, there is no technical limit yet.

Mr. Roybal.

Mr. ROYBAL. I would also like to compliment our colleague for his presentation to the committee and for the help you are giving us this morning.

I have, however, one question. This is in regard to a study that has been authorized by the General Assembly of the United Nations.¹ It is my understanding that the study is due next year. I was just wondering whether in your opinion it is a study in depth and sufficient to answer some of the questions that you have proposed to the committee.

Mr. HANNA. The gentleman picks up a very salient, interesting and, I think, important point, in that in the last session, the 21st session of the United Nations, a resolution did set up studies which were to report in the 23d session, which would be about this time next year that they would be reporting on those studies. So that it seems rather passing strange that right in the middle of their own studies they should be putting on the agenda consideration of a resolution which makes a disposition over the matters which are being studied. Cer-

¹ See appendix, p. 222, for text of resolution.

tainly I think that will probably be brought out very clearly in any discussions on the resolution. I would hope so.

Now, to answer the second part of the question as to whether or not the studies authorized were of sufficient depth, my own feeling is—I express this with some humility in that I am not outstanding as an expert, but to the degree that I understand the direction of those studies—they are not of sufficient depth. I would think that one of the possible motivations out of the discussions that might occur on Malta is to add to the depth of these studies and give them more particularized instructions and perhaps lengthen out the time in which they will be undertaken and have a continuing report to the U.N. over a period of several years. I think that would be a more realistic way to handle it.

Mr. FASCELL. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I should also like to compliment Mr. Hanna for very interesting testimony today. If the other witnesses are as good, we are going to have some interesting discussions.

I would like to explore briefly with you—I think it is important that we hear from Mr. Popper to get the State Department's view today on this whole question—the role of the United Nations. As I understand it, you feel that the United Nations should serve as an adviser in this field? It should provide a forum for the resolution or discussion of differences between nations which are considering exploitation or are able to exploit the resources of the sea?

Mr. HANNA. Yes.

Mr. FRELINGHUYSEN. As one reads the resolution, one could detect—and I would suppose that was the intention of some of the sponsors of the resolution—one could detect what could be considered an anti-United Nations feeling, that these kinds of resources under no conditions at any time should be transferred to the United Nations.

This is not your objection? Your objection is primarily to the timing of a move now to determine where sovereignty lies, or a transfer of sovereignty to the United Nations, is that right?

Mr. HANNA. That is basically correct. I don't know what my attitude would be when this matter is presented 2 years hence or 3 years hence or 4 years hence because I don't know whether the developments are going to unfold. At some time it would appear to me they would definitely indicate a wider role for the U.N. It seems to me, without question, that could be clearly predictable. At what point in history that wider role would be assumed and just exactly to what scope it should be broadened, I think we can best leave to the evolving conditions.

Mr. FRELINGHUYSEN. Where, in your opinion, does sovereignty of these seabeds now lie?

Mr. HANNA. It would be determined, I suppose, on the basis of your legalistic philosophy. To me the seabed now is in the realm of no one. What in Latin we would call *res nullum*; that it is open to appropriation and prescriptive rights by anyone. That would be, it seems to me, entirely in accord with our "freedom of the seas" concept.

One could, however, challenge that by saying, "Wouldn't it be better to turn it around and look at it as if it were the domain of everyone?"

res commune which would then say, "Well, it isn't something that anybody can go out and appropriate, but you have to give consideration that you are developing it for everyone because it does belong to everyone."

Mr. FRELINGHUYSEN. Would you care to put yourself in one camp or the other?

Mr. HANNA. Because I think you need the incentive to go out and put in the capital to actually develop it, this is in the realm of no one.

Mr. FRELINGHUYSEN. If it is in the realm of no one, what incentive is there to do something about it?

Mr. HANNA. I think that was the realm of space before the intrusions into space and it still is. However, that did not preclude the United Nations as being one of the forums in which all could participate to set down certain guidelines. That could be applicable here and to this degree you have a margin between the two; that it isn't strictly the realm of no one; it isn't strictly the realm of everyone, but there is trying to be an emergence of these concepts and that ultimately it might be a wing of both or the emergence of a third criteria, or the selection of either one.

Mr. FRELINGHUYSEN. You talked at one point of an eventual necessity, or the advisability, of making an equitable distribution of these resources, and you suggested that somebody, or some entity, might offer prescriptive rights to those who were able to exploit.

Are you suggesting in both cases that perhaps the U.N. should make a determination as to how much exploitation could be carried out by any country, and offer an exclusive right in a certain area, say, to an individual nation?

Mr. HANNA. Not at this point. I am not suggesting that is the appropriate move at this point.

Mr. FRELINGHUYSEN. No one might be in a position yet, but I am saying, would this be a reasonable role? Do you envisage the U.N. providing some kind of arbitration between competing nations who have a capability and who might otherwise take it on themselves to move alone?

Mr. HANNA. Well, this is happening in the North Sea in just that way. I believe I could get a report for the committee of the arbitration that is now taking place between the nations that abut the North Sea relative to the extraction of the gas from that area. You will find there a demonstration of arbitration to try to work out the conflicts that result.

Mr. FRASER. Do you know who the parties are to that arbitration?

Mr. HANNA. They are the nations that rim the North Sea. I don't have them in the forefront of my mind right now, but I know one of the key disputes right now is between Germany, which had the misfortune of only having a very small chunk on that particular sea, and a couple of her neighbors to see if they couldn't arbitrate a little broader swath out there to participate in the slicing of the North Sea pie relative to the gas deposits.

You see, if you evolve your law to a practical situation like this, you can see what concrete problems have to be dealt with. Then when you approach this business of vesting the grant authority in anybody, you are doing so with some history of actual problems and it seems to me you would be more apt to do correctly what you are attempting

to do than to move out broadly and generally in a sweeping manner over something there is not too great an understanding on.

Mr. FASCELL. I want to thank our distinguished colleagues for this thorough and interesting discussion. I have to add here that the latter part of this discussion about the legal theory of ownership—sovereignty, if you will—with respect to the sea or the deep bed of the sea is very interesting. There is a substantial problem, as I see it. There might be a tremendous distinction between the freedom of the seas in international law as it is now known to exist, and “freedom of the seabed.”

I am not being definitive, but I think I support the present position of our Government, as I understand it. It seems to me the Maltese effort, aside from establishing the prior position of the Maltese Government, has also served another useful purpose. Its action serves to highlight the existence of the problem and one attempt at its resolution that now is taking place in the North Sea. I am not sure that the coastal states of the North Sea have the right to arbitrate among themselves in what manner and proportion the resources of the sea shall be extracted.

The very real question that is in the air is, are we going to establish sovereignty of the seabed and resources of the bed and water by the exercise of national rights? Are we going to establish sovereignty by separate agreements on a case-by-case basis? Are we going to establish sovereignty by conventions, such as the one entered into by the coastal states? What is the right of sovereignty? Is it dependent upon the state of the art in extracting of resources from the water, or the state of the art in extracting resources from the seabed or the state of the art on the interactions of the land, water, and the seabed?

I think it is important to get on the record the questions raised by the Maltese proposal and thorough discussions of them.

Mr. HANNA. I agree 100 percent with what the gentleman says. You have summed up fairly well the areas of the dispute. If you take the Continental Shelf agreement, it really goes on exploitation. That is the way I look at it. It is an extension of exploitation.

If you go on the basis of the North Sea case, it is a prescriptive right of the state moving its exploitation out until it meets somebody else's exploitation right, moving directly in front of it, and that was the middle of the North Sea where the Great Britain interests moved out one way and the continental interests moved the other. This business of whether or not it should be the possession of everybody has to be brought in too. You have at least three or four different basic concepts, all of which have had some experience.

For instance, I have been thinking about the interesting situation of the coal mines out of Great Britain that have gone in under the bed of the sea. They have not disturbed the bed of the sea, but the subsoil of the bed of the sea is exploited far below 200 meters with extension of tunnels over the land down into the sea.

We have the same thing in oil in my State. You drill the hole on land but slant drill it out and you are really exploiting the oil out there below 200 meters, so really that has already been established.

It is a matter of existing law. It has been developed on the basis of an actual situation. Now, when you start changing things around you are going to have to deal with existing situations.

Mr. FRASER. There was in the dialog some question raised as to the Maltese motives. I only want to put on the record my own view, which is that I think Malta is to be commended for its leadership in the international community in raising this kind of question. I find it hard to see that Malta, first, itself, gains much out of this except increased stature within the community of nations. Malta is not asking for something for herself. She is asking that the international community take cognizance of this problem. I don't mean to argue with anybody else's interpretation, but I want to express my own on the matter.

I think it is time it was raised and discussed in the way we are discussing it and time it be discussed in other international forums across the world.

Mr. GROSS. Mr. Chairman, may I make one quick observation?

Mr. FASCELL. Mr. Gross.

Mr. GROSS. The gentleman from New Jersey, Mr. Frelinghuysen, raised the question as to whether Mr. Hanna was opposed to United Nations jurisdiction at this time or at any time. Let me make it clear, and for dead sure and certain, that I am opposed to this being turned over to the United Nations now or at any other time. As a sponsor of one of these resolutions, I would not be a party to delegating this decision to the wind tunnel known as the United Nations.

Mr. HANNA. On this matter the gentleman has seldom been in doubt. However, I can't make such an unequivocal statement myself. I want to see what the future brings.

Mr. FRELINGHUYSEN. If I might just comment on the wording of the resolution, I would think Mr. Gross at least might have some reservations about his own resolution, because it would seem to clearly imply that at some time it might be highly appropriate for the United Nations to take a vigorous role. At present we have only limited understanding.

Time and again the resolution cautions against any action at this time. It doesn't suggest at a later time, a little further down the road, it may not be of great importance for the United Nations to play a role.

As I said, I expect some of the sponsors of the resolutions are opposed to the United Nations itself, and I would think the wording of the resolution can be read either way. It can be read that there is a role for the United Nations—and Mr. Hanna is one of the sponsors who has indicated he feels there is a role for the United Nations.

Mr. HANNA. In the determination of any short-term crisis you should never sell off any of your long-term alternatives.

Mr. FASCELL. Thank you, Mr. Hanna.

We are now pleased to have another one of our distinguished colleagues from a great coastal State, the Honorable Ed Reinecke, of California. He's been waiting to make his views known and we are glad to have him here.

STATEMENT OF HON. ED REINECKE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. REINECKE. It has been a very entertaining wait.

I will ask permission to submit my statement for the record and then bring out points that have not already been touched on.

Mr. FASCELL. You have made a lot of points with the subcommittee with that action.

Without objection, we will include your statement in the record. (The statement referred to follows:)

STATEMENT OF THE HON. ED REINECKE, OF CALIFORNIA, ON THE PENDING HOUSE JOINT RESOLUTION 824 AND SIMILAR LEGISLATION

Mr. Chairman, I appreciate this opportunity to appear before this Committee to express my grave concern about a proposed action in the United Nations General Assembly.

The Permanent Mission of Malta to the United Nations has proposed for the agenda of the General Assembly "a declaration and treaty concerning the reservation exclusively for peaceful purposes of the seabed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind."

As a member of the House Merchant Marine Subcommittee on Oceanography I am alarmed at the Pandora's box of international political and technological problems which would be created by this Maltese Resolution.

Like the proverbial iceberg, however, there is more here than meets the eye. The proposed resolution by Malta is not the only action pending before the United Nations on this subject. The Soviet Union has announced its intention to introduce a resolution before the Intergovernmental Oceanographic Commission of UNESCO to create a working group to draft a convention to deal with exploration and exploitation of mineral resources beneath the high seas.

The Russians have chosen this particular forum of the United Nations in which to take their action because several of the high positions in the I.O.C. are held by citizens of the Soviet Union. Their experience has been that they usually receive very sympathetic treatment in this organization.

Farther down the road is the critical date of 1969 when consideration of revisions of the Geneva Convention of the Continental Shelf becomes in order, at the end of the first five years of that Convention's operation. Considerable study is being given to a re-definition of the continental shelf. Experience has shown there are problems with the present three-dimensional definition which reads, "to a depth of 200 meters, or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources."

Problems involving very deep trenches which separate continental shelves from coastal nations; of the very limitations of an arbitrary 200 meter isobath; and the fact that effective exploitation of the ocean floor can now be accomplished at depths far beyond the 200 meter figure will probably be discussed in 1969 at a new convention meeting.

As we trace the history of United Nations action concerning exploitation and jurisdiction over the ocean floor and its resources we find, unfortunately, that we are in the present situation because of action which was taken by our own Government just last year.

Our Ambassador to UNESCO the Hon. James Roosevelt, formerly a member of the House of Representatives, authored a resolution instructing the Secretary General of the United Nations to conduct a study to coordinate all of the technological projects dealing with oceanography conducted by the various nations. By bringing all of these programs under UN coordination, it was stated that there would be great exchange of technical data, greater expediting of technical study, and more efficiency in gathering information.

This resolution, number 2172, was passed by the United Nations General Assembly on December 8, 1966. This action was taken after the Congress had enacted the Marine Resources and Engineering Development Act of 1966 which strengthened significantly this nation's oceanographic programs.

Frankly, Mr. Chairman, it seems that in this Administration the right hand does not know what the left hand is doing. On the one hand steps are taken to significantly advance the marine resources and oceanographic programs of the United States for our own national interests. And on the other hand action is taken to give it all away to an international organization over which we have little, if any, influence, except to pay the bills.

The stated purpose of the Marine Resources and Engineering Development Act of 1966 was to encourage private investment in ocean activities; to accelerate development of marine resources, and to preserve the United States as a leader

in marine science and resource development. Cooperation with other nations and international organizations in marine science is to be done *when such cooperation is in the national interest*. Clearly this Government has gotten us into the difficult position of starting the tidal wave by which we may very likely be inundated.

The Maltese Resolution is certainly no general, study commission type of action. It calls for a specific treaty with many very disturbing provisions. Their resolution expresses the *fear* that the ocean floor will become subject to national appropriation and use. They call for a treaty forbidding appropriation of the ocean floor by a nation "in any manner whatsoever." Many high-sounding, but meaningless, phrases are used to justify this extraordinary action: "safeguarding the interest of mankind," ocean floor shall be "reserved exclusively for peaceful purposes, in perpetuity," and "for the development of poor countries."

DEVELOPING COUNTRIES

Mr. Chairman, at this point in our own marine research program development it would be a serious mistake for the United States to support a resolution such as that proposed by Malta.

The Maltese Resolution calls for the United Nations, or some similar international organization, to assume jurisdiction over "the sea-bed and ocean floor, underlying the seas outside present territorial waters and/or the continental shelves." Another similar phrase—"the ocean floor, underlying the seas beyond the limits of present national jurisdiction."

These phrases might have solid, legal significance, except that they could easily be changed in the next few years. In 1969, we have that meeting to revise the Convention on the Continental Shelf. What "continental shelf" and "territorial waters" and "present national jurisdiction" mean now, they probably will not mean after 1969.

We see, therefore, that the Maltese Resolution is anchored to the bobbing cork of changing international law and political theory. There is nothing solid and concrete on which to carry forward this nation's marine resources and oceanographic programs.

The present state of the technology of the sea is in such a mobile condition that it would be dangerous to begin to make political decisions based upon what we know. Just a few years ago 200 meters was considered a reasonable depth for effective exploitation of the resources of the ocean floor. But right now exploratory drilling is being planned in water depths exceeding 4,000 feet, several hundred miles offshore.

In reality, Mr. Chairman, we probably know less about the bottom of the ocean, and its resources and potential, than we know about the surface of the moon. It would be completely foolish for us to begin to divide up jurisdiction of the moon. It would be foolish to give jurisdiction over the moon to the United Nations. It is equally unreasonable for us to talk about political jurisdictions on the bottom of the sea.

There are too many questions to answer before the United States agrees to such a Resolution as proposed by Malta. The United Nations would be acting out of ignorance.

Questions are still unanswered concerning the food potential of the sea; the possibilities of fish utilization for human consumption; the technology of aquaculture. We are not sure how the ocean behaves in its depths. What kinds of tools must be used to get into the sea? How can we mine from the floor of the sea? Can man survive in the environment of the sea?

Scientific exploration could be seriously hampered by a premature definition of political jurisdictions. The Report of the Panel on Oceanography of the President's Science Advisory Committee, entitled "Effective Use of the Sea" on page 91, states, " * * * significant interference with scientific research from the existing or future legal regime of the sea could pose serious obstacles to the entire national ocean program. That there is occasion for concern about this matter is plain."

Nearly five-sevenths of the world's surface lies at the bottom of the sea. That is too much territory to give away, especially when we do not even know what is there.

There exists a large body of international law to cover the remote possibilities of conflicts between nations or private interests operating under national flags. If expeditions from too many nations find themselves in dispute over a rich mineral deposit, the questions raised are going to be settled by accommodation among the various parties, and by the gradual development of adversary case law. We are not left in a vacuum, if we do not follow the Maltese position.

For these reasons, Mr. Chairman, I strongly urge adoption, by this Committee, and by the Congress, of these pending resolutions expressing the sense of Congress in opposition to the Maltese Resolution. My own bill, H.J. Res. 830, now before the Merchant Marine Committee, goes a step further in calling for a specific study by the National Council on Marine Resources and Engineering Development of the resources of the ocean floor. It is apparent that we must move swiftly to develop the technology we need in order to deal effectively with these political problems centering around the ocean floor and its resources.

I would urge, Mr. Chairman that the legislative history of these various resolutions show that the Congress requests the President to instruct the United States Ambassador to offer alternative proposals to the United Nations General Assembly calling for further study, and calling for a moratorium on action pending the outcome of the 1969 revision of the Convention on the Continental Shelf.

Thank you.

MR. REINECKE. I serve on the Subcommittee on Oceanography of the Merchant Marine Committee and all of us on that committee are very much concerned and alarmed over the situation. I am happy to say personally that I find our State Department's position as given before the committee is one certainly not of full endorsement of this resolution and it appears that the crisis aspect of it is not as apparent as we thought at the beginning. However, I certainly would like to commend the chairman and the members of the subcommittee for (1) the attendance here today, and (2) the expeditious handling of this matter. It is something I think needs to be considered seriously by the Congress before it becomes a matter on the agenda for discussion in the United Nations, and I think that you deserve a great deal of credit.

One point that has not been brought out is the fact that the Soviet Union has announced its intention to introduce a resolution before the Intergovernmental Oceanographic Commission of UNESCO to create a working group to draft a convention to deal with the exploration and exploitation of mineral resources beneath the high seas.

I point this out because I think if we want to try to trace an evolutionary step to this resolution, this may be an indication that the Maltese resolution is only a crack in the door and that there are other thoughts and other motivations perhaps by other countries behind this, so that I think it adds some serious moment to the Maltese resolution in the light of what may follow as a result of the disposition of this resolution.

I think also we have to consider that while we are talking here specifically about the seabed—and, as Mr. Hanna noted there is a great deal of difference between the surface and the body—once again by accretion these things have a definite relationship to one another. Whatever laws, resolutions and regulations that may be adopted on the seabed, may have a way of getting into the body of the sea and in some way affecting the surface and the freedom of the seas. Certainly we have a great historical body of law concerning the surface and I think this must be given serious consideration.

With regard to the Russians submitting a resolution, they have, I understand, several people of very high position on this Intergovernmental Oceanographic Commission and further down the road, as was pointed out, is the fact that in 1969 the Continental Shelf Convention is to reconvene once again. So when we talk here in terms of disposition or establishing a sovereignty for these lands beyond the Continental Shelf, in view of the fact that that definition itself is in such a state of flux, I think we are dealing with something that may have some very

long-range hazards, or assets either way, which is a question we just don't know about at this point.

I think because of the newness of the whole concept of an agreement on the continental shelf—and certainly we don't have an agreement—let's not be mistaken to think that this 200-meter depth is universally adopted or agreed upon any more than the fishing territorial rights are agreed upon, as exemplified by our friends in South America.

As has been pointed out, we are in a very premature position to start talking about any kind of sovereignty whatsoever.

As a specific example, the Department of the Interior recently issued a set of maps leasing lands as far as 100 miles offshore of California, and to a depth of 6,000 feet.

Now, the Continental Shelf agreement, the 1958 Geneva Convention, goes to 200 meters, so here our own Department of the Interior has already involved the United States to a depth 10 times that great and 100 miles offshore.

I only point this out as a means of, perhaps—I don't mean to say confusing the issue, but at least adding some ingredients to the issue to justify a very independent investigation that I know this committee will make.

The James Roosevelt resolution has been mentioned. I would like to simply quote one line from that resolution. It says, "Realizing that the effective exploitation and development of these resources can raise the economic level of peoples throughout the world, and in particular of the developing countries * * *." I point that out because we all know what the head count is in the United Nations now with the developing countries, and if a resolution is adopted to the extent it will be advantageous to those developing countries, I think the leading powers of the world, the ones who have put all the money into this situation, will not really have a very effective voice when it comes to the floor. I think this, too, should be recognized, that if this is the direction of these United Nations resolutions, then I think they take on an added burden of gravity to the best interests of the United States.

Interestingly enough, the Marine Resources and Engineering Development Act of 1966, was to encourage private investment and private enterprise to develop the offshore. It is inconceivable to me to find anyone actively investing his own money into an area where he does not know how long he will have access or right or title to gain the benefits from this. We all recognize the high cost of offshore exploitation and certainly if there is any question as to the title, no one starts digging holes, or mining for minerals that may not be his once he finds them.

The cooperation with other nations, according to this law again, is to be underlined when such cooperation is in the national interest. Recognizing the international aspects of this situation, I am representing part of the United States and will look out for the best interests of the United States.

A point that I believe was not made is the tremendous effect on the defense structure of this country. We have places in California where the Continental Shelf, according to the Geneva Convention, is less than a mile from shore. If we are to allow this to become some quasi-international type of territory, I think we are allowing ourselves to

be exposed to a risk far greater than any of us would normally or reasonably consider.

Likewise, if it is conceivable that other countries would be able to exploit this mineral asset off our shores, I think we are going to break the back of our own oceanographic program. It is you ladies and gentlemen sitting right here who will vote on the appropriations for such a program. If there is doubt that this investment will yield an indisputable tangible benefit to this country, I question that the appropriations will flow as freely as we would like to adequately develop a good, firm, strong, oceanographic program. If we invest the money we need assurance that it is our program and that we can dispense our foreign assistance in whatever manner we would like to do, but I do feel the choice should be ours.

In the hearings which we have been conducting in the Oceanographic Subcommittee we have heard, for instance, from the Atomic Energy Commission. Today we hear from the National Science Foundation, the Smithsonian, many other agencies. The Atomic Energy Commission added some light which I had not considered regarding the movement of radioactive materials in the ocean itself. The fact that they have found, you might say, a concentration of cesium isotopes which doesn't go into uniform solution, but concentrates itself at certain depths and temperatures. There are some aspects of scientific disciplines here that I think again call for a great, long, hard look before we talk in any serious terms about passing on the sovereignty or the free use of the ocean for these things.

We are all enamored with the possibilities of the potential of the sea and I feel the only way we are going to adequately exploit it without being a total Government program is to make it possible for the profit motive to come into the picture to where people are willing to go out and drill or mine or fish or build structures on the bottom using private capital. Once we bind this thing up in some sort of an international agreement, I question that we will find very much private capital venturing into the depths of the ocean.

Scientific exploration, I think, could be hampered, although I feel sure that the United Nations would not intentionally hamper it, but just the many unanswered questions that would come—or at least until they come—would quite possibly seriously hamper some investigations of this nature.

Regarding the resolution, I am a coauthor. You might be interested to know that the Oceanography Subcommittee again was so concerned about this matter that we took under our own initiative to introduce an additional resolution which in turn was referred to the Oceanography Subcommittee so that we could hold some hearings on this very same issue, but this, again, is mentioned only as a means of indicating the seriousness with which this is looked upon.

I think we must give this a great deal of study. Certainly the far-reaching, the untouchable bottoms of the ocean are going to become touchable and usable one day soon and certainly there should be some guidelines, some general approach that the world in general will acquire some of these assets or at least the benefits from them. I think the structure, the organization must be done in a manner that will allow the adequate exploitation and the proper development of this bottom and to talk in terms of sovereignty and sovereign rights,

I think this would be a bad mistake. The United Nations role at best would be to try to organize some form or perhaps forums, such as the North Sea group that are negotiating within themselves. There are just an awful lot of questions that need to be answered.

The 2-year study called for in the James Roosevelt resolution, I think, can be far less than adequate. Our own Government has been studying the oceanographic possibilities for years, and we still don't have much of a picture about what we are really talking about. To ask any group—I don't know what their budget was on this particular investigation—but to ask any group to make a comprehensive study in a 2-year period is just something less than realistic.

First, if they start talking about it this year, they will not have the benefits of their own investigation and even if they start talking about it next year, they will have the benefit of only a very cursory investigation; probably nothing more than a compilation of the papers that have been issued on the subject without any genuine investigations or contractual, scientific investigations of their own.

I believe that is the extent of what I would like to add, Mr. Chairman.

I would like to say I expected to have a statement from the Governor of my State. It did not arrive when I came over here this morning, but if it does, I would ask unanimous consent to include it in the record to indicate his position on this particular matter.

MR. FASCELL. There will be no objection. The record will be held open for the inclusion of the Governor's statement. We have many other statements for the record today which others want to put in, and we will hold the record open for that purpose.

MR. REINECKE. Thank you.

(The following telegram was subsequently received from the Governor of California:)

SACRAMENTO, CALIF., September 28, 1967.

Hon. DANTE B. FASCELL,
Rayburn House Office Building,
Washington, D.C.:

Reference Pending Congressional Resolutions Opposing United Nations Acquiring Jurisdiction Over Ocean Resources.

Please record my support of these resolutions.

Too little is now known of the ocean potential. Therefore, action permitting or approving U.N. jurisdiction is at this time premature.

California is rapidly progressing its master plan for the conservation and orderly development of ocean resources with our national posture having the highest priority.

RONALD REAGAN,
Governor of California.

MR. FASCELL. I want to thank you for summarizing your statement concisely, and for raising points which heretofore have not been mentioned in this subcommittee.

It seems to me there are two sides to the point you make because of the fact that there is a study now under way as a result of the resolution adopted by the General Assembly, the reports on which study are not due until the 23d General Assembly. That study might be inadequate. I suppose we will have some suggestion before we are through here on how long the study ought to be. There is some validity to the fact that any action or determination on sovereignty would be premature in the

light of the existing studies which have not yet even been completed.

The other side of that, however, seems to me to be that we are already making decisions in international law every second, every hour, every minute, every day. I am not sure I support or concur in the action of the coastal states of the North Sea agreeing among themselves with respect to the exploitation of the resources of the North Sea. What precedent does that set for other seas, oceans, and other bodies of water?

I am not sure that is best for the United States. Is not such an agreement making international law? Are they establishing a precedent? If we wait for studies, by the time we get through studying the problem there won't be any resources left over which to exercise national jurisdiction and sovereignty or to reach a new international agreement thereon.

I have grave reservations about the Malta proposal. I also have grave reservations about studying the problem to death or waiting until it automatically resolves itself by piecemeal decisions.

Mr. Fountain.

Mr. FOUNTAIN. Thank you, Mr. Chairman. I would like to say that during this week, as an unbriefed, disoriented and inexperienced delegate to the U.N., one of the first things I heard about when I got there was a news story to the effect that we were planning to join other nations in making disposition of these ocean beds to the United Nations. I became a little frustrated because I realized I was wearing two hats, one as a Member of Congress and another as one of the delegates to the U.N. Yet, I felt compelled to express my opposition to such action—should it be contemplated.

In the meantime, I discovered that you had called for hearings—and I want to congratulate you, Mr. Chairman, and also my fellow North Carolinian, Congressman Lennon, for your alertness in calling them. Mr. Chairman, I appreciate your calling me to tell me that hearings would take place.

Mr. Chairman, I was not here to respond by telephone. I was preoccupied at the U.N. However, my presence here today is my response.

I am unalterably opposed to our giving away anything to anybody. I don't know what our rights are and I don't know what our needs will be in years ahead. I don't know what the situation will be. I think this thing is ill-timed. Studies are being made. Here is the resolution which has been referred to. A report is to be made to the 23d session. Insofar as I have been able to ascertain, in consultation with delegates and our Ambassador to the United Nations, and also representatives at the State Department, and from Mr. Popper's statement given this morning—our Government has no intention of giving our rights away to the U.N. or any other international organizations.

It is my understanding that any position we take in the U.N. will be more or less a matter of strategy, but consistent with the best interests of this country. Frankly, I don't think it is a matter that should be placed on the agenda of the United Nations at this time. However, I'm sure our Government will protect our interest. That will certainly be my aim.

I realize I am a member of the delegation and once a decision is made, even if I should disagree with it, it will be the Government's decision. We can't speak with two voices. I also introduced a resolution on the matter. One change I would make in it is the one Mr. Frelinghuysen's comment suggested. I would strike out the portion "at this time." So Mr. Gross and I would be consistent in our views. I don't know what my views will be in the future, but I do know that this is an extremely important field. Frankly I am one who thinks we ought to be investigating the ocean depths faster than we are outer space. I think oceanography is an extremely important field and a tremendous amount of study and investigation is absolutely necessary by the countries who are prepared and adequately equipped and financially able to do the job.

I do not think the United Nations, on the basis of my study of it during recent years, is even mature enough to make the kind of investigation and study that ought to be made. Yet I think it is a field where they are justified in having their committees make the survey and the studies, and I think this resolution which was passed in the 21st session was designed, more or less, to find out what is being done in the field so that all of the member nations would know what was going on. I just wanted to get my views on the record, Mr. Chairman, and to thank you for giving me that opportunity.

Mr. FASCELL. Mr. Reinecke, you see you have stimulated a great deal of interest.

Mrs. Bolton?

Mrs. BOLTON. I am particularly interested in this because I have had occasion to dig into it a little bit. I think it is a very thrilling thing that the United Nations, through the Malta proposal or in any other way, should be alert to the vast fields that it opens up and to the extraordinary era we are living in. When you look back just a little way, any talk of going below the ocean floor was just ridiculous. Now that matter is right before us.

I sincerely hope that all consideration of it will be done with great care and patience and careful timing. We have enough troubles in the world without raking them up from the bottom of the sea. If we do need what is there—I should say we do need the knowledge of what is there, but perhaps our grandchildren, our great-grandchildren will need it more than we do. Let's not do anything at this point that will make it more difficult for them to use it.

I am very, very happy to feel that there are so many of you who are in on this resolution and who are really taking such a deep interest in it. I hope that that will continue.

I hope the chairman will be, as he always is, very kind and let me come to these meetings.

Mr. FASCELL. We are delighted to have you, Mrs. Bolton.

Mr. Fraser?

Mr. FRASER. Thank you, Mr. Chairman. I want to add my voice to the others. I think that your comments have helped to round out the discussion in a very important and useful way. I was curious as to your response to one question. I do not want to mislead you on it, it is just a matter of curiosity, as to how you might want to approach it.

Supposing it were politically feasible that the Suez Canal could be transferred to international jurisdiction with some of the revenues

going to the United Nations, would you think in the interests of our country and others that this would be a useful thing?

Mr. REINECKE. No, because the next step would be for the United States to lose the Panama Canal and I am not willing to give that up.

Mr. FRASER. I have no further questions, Mr. Chairman.

Mr. FASCELL. Mr. Gross.

Mr. GROSS. Thank you, Mr. Chairman.

I simply want to commend the gentleman for his statement.

Mr. FASCELL. Mr. Roybal.

Mr. ROYBAL. I have no questions.

Mr. FASCELL. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. I have no questions, Mr. Chairman.

I would like to thank Mr. Reinecke for coming. It has been interesting to hear from him.

Mr. FASCELL. Thank you very much for being here.

Mr. REINECKE. I would like to add one comment, if I may.

I don't know whether you have the Navy on your witness list or not. I suggest that you consider this because certainly one of the first lines that would be drawn in the serious consideration of this in the United Nations is to have a nonproliferation of armaments or defense structures discussion. We are already there. I think the Navy is in the best position to advise you.

Mr. FRELINGHUYSEN. I am interested in the wording of the resolution that went to your subcommittee. It might be of value to know how two different committees get jurisdiction over a problem of this kind. I ask unanimous consent that the other language be incorporated.

Mr. FASCELL. Without objection, House Joint Resolution 830 will be incorporated in the record at this point.

(H.J. Res. 830 follows:)

[H.J. Res. 830]

JOINT RESOLUTION

To provide for a study of the resources of the ocean floor by the National Council on Marine Resources and Engineering Development, and to prevent certain premature actions which might adversely affect the interests of the United States in such resources

Whereas the national goals of the United States for the development of the ocean floor's resources have not been clearly defined, nor has an approach to the development of these resources been formulated; and

Whereas at present we have only limited understanding of the extent of the undersea resources, the means of obtaining access to them, the conditions for processing and marketing them, and the impact which activities connected with their extraction and mining will have on other uses of the sea; and

Whereas the Congress of the United States in 1966 enacted Public Law 89-454 for the expressed purpose of establishing two official bodies—the National Council on Marine Resources and Engineering Development, and the Commission on Marine Science, Engineering, and Resources—to identify national objectives concerning undersea resources and recommend Federal programs to accomplish these aims; and

Whereas strong efforts are being exerted by certain groups and individuals to immediately place the United Nations in control of the resources of the bed of the deep ocean beyond the Continental Shelf; and

Whereas a number of highly responsible national organizations, representing a broad segment of the American public as well as many of the parties interested and experienced in the development of undersea resources, have expressed opposition to conferring title at this time to such undersea resources upon the United Nations: Therefore be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That section 4 of the Marine Resources and Engineering

Development Act of 1966 (33 U.S.C. 1103) is amended by adding at the end thereof the following new subsection:

"(c) The comprehensive study described in subsection (a)(5) shall include a study of the resources of the bed of the deep ocean beyond the Continental Shelf of the United States with particular reference to the definition of our national goals for the development of such resources, the formulation of approaches to their development, and the establishment of methods and programs for increasing and improving our understanding of their extent, the means of obtaining access to them, the conditions for processing and marketing them, and the impact which activities connected with their extraction and mining will have on other uses of the sea."

SEC. 2. It is the sense of the Congress that, until the completion of the comprehensive study provided for in section 4(a)(5) of the Marine Resources and Engineering Development Act of 1966 (and more specifically described in section 4(c) of such Act), any action to vest control of deep ocean resources in an international body would be premature and ill advised; and the President is requested to instruct the United States representatives at the United Nations to oppose any action at this time to vest control of the resources of the deep sea beyond the Continental Shelf of the United States.

Mr. REINECKE. Thank you, Mr. Chairman.

Mr. FASCELL. Thank you very much. I want to say before you leave that we are aware, of course, of the naval problem and the installations that exist. This emphasizes the difficulty, of course. Also, we might as well put on the record that there is substantial disagreement among the nations as to the limits of international waters and freedom of the seas. We have differences of opinion all over the world on what those limits ought to be. Thank you for raising this additional point.

Mr. REINECKE. Thank you.

Mr. FASCELL. Now we are very pleased to hear from a distinguished colleague, a representative of another coastal State on the other side of the country. He is, as is his State, equally involved, equally interested, and a leader in the field of oceanography.

I am delighted to welcome before the subcommittee my colleague and friend, the Honorable Paul Rogers of Florida.

STATEMENT OF HON. PAUL G. ROGERS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. ROGERS. Thank you very much. I appreciate the opportunity to testify. I will just submit my statement, if I may.

Mr. FASCELL. Without objection, the statement will be included in the record.

(Mr. Rogers' statement follows:)

STATEMENT OF HON. PAUL G. ROGERS A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. Chairman, I would like to thank the committee for taking immediate action on this very serious matter of the proposed internationalization of ocean bottoms of the world outside the present national boundaries.

I have felt strongly about this issue for more than a year. I opposed the idea of giving the seabottoms and the resources thereof to any international body. For that reason, I introduced H.J. Res. 823 when I found out that Malta planned to introduce such a resolution in the upcoming session of the United Nations. The Malta resolution would reserve all ocean bottoms and the resources outside national territorial borders for the United Nations.

The United States has led the world in research and development in the marine sciences and American industry has invested millions of dollars. I do not think the rewards of such labor should be denied.

If the Malta resolution were in effect, it would handicap industry and dampen its enthusiasm and indeed hinder our national defense. For when we develop the technology to go beyond the continental shelf, we would find ourselves facing with a wall of international ownership.

I further believe that the proposed Malta resolution would change the law as established in the 1958 Geneva Convention which restrains a nation's seaward boundaries to the continental shelf only if that nation can exploit no farther.

During the convention, this definition of the continental shelf was formulated: "the sea-bed and the subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or," and I repeat for emphasis, "or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said area."

It is my sincere hope that the committee will endorse the many resolutions introduced in the House to instruct our Ambassador to the United Nations to oppose the Malta resolution and any other which would give away the ocean bottoms.

Mr. ROGERS. I realize you have probably gone into most of the details so I will try not to use up too much of your time.

First of all, I want to say I am delighted that you are holding hearings. I think it is necessary to quickly formulate strong feelings on this which may be expressed by our representative in the United Nations.

Mr. FASCELL. I think you heard Mr. Fountain express himself rather strongly.

Mr. ROGERS. Yes. I hope he will talk to Ambassador Goldberg.

Mr. FOUNTAIN. I might say I will so express myself there. So far, I do not think there is any difference of opinion among the delegates.

Mr. ROGERS. That is encouraging and we are delighted you are there to make those views known. It seems to me that the present law permits us to go beyond the continental shelf now. The Geneva Convention, and I presume you have gone into that with the other witnesses, so provides. It says you can go beyond the 200-meter limit to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said area. So present law now permits us to go beyond the continental shelf from the 200-meter area.

Mr. FASCELL. Was that the exact language that you read?

Mr. ROGERS. Yes.

I cannot understand why we should support anything that changes present international law. This has already been recognized. Why get into this? We ought to say the law is there. This is the law and we ought to uphold it and the present international agreements.

Mr. FOUNTAIN. If you will yield.

Mr. ROGERS. Yes.

Mr. FOUNTAIN. You are referring to article 1 of the Law of the Sea Convention on the Continental Shelf, I assume, are you not?

Mr. ROGERS. Yes.

Mr. FOUNTAIN. And other pertinent articles.

Mr. ROGERS. Yes.

It is very significant to us as we reach the threshold of the development. I think, and I am sure you know. American industry has already formulated plans that will take us to the mid-Atlantic range. This includes occupation below the waters on the bottom of the sea to a position where we could occupy it and defend it. To allow any resolutions, such as the Malta resolution, to come in at this time simply

puts up a barrier and confines us to 200 meters off the coast of the United States.

Already on the west coast the Department of Interior has granted three lease provisions at a depth of 6,500 feet off our west coast. Our industry is now in a position of being ready to move and we don't want any legal barriers thrown up when the present law permits us to go out beyond and begin to regain some resources of the sea.

I think we have not yet visualized the tremendous impact that is going to be felt in the Nation and in the world, particularly by our Nation, when we can go down in a very few years and actually occupy the bottom of the sea, be able to live there, be able to exploit the resources of the sea and seabed.

Already, as you know, the Navy has conducted tests where they have stayed under water for 30 days. This is just the beginning and we have not yet visualized what is going to come. It is not going to be long before we will have restaurants and hotels right off our coasts where people go for their vacations where they can watch the fish and the sea life. The mineral possibilities are there. The oil is also important. Fifteen percent of our supply already is coming from right off our shores.

This is going to increase. So there are many ramifications. To allow legal blocks to be put up now, I think, would be the most serious position this Nation could get itself into. This is the one great area where we are now ready to go in and do something that is going to benefit the American people and, in effect, benefit the world.

Why, I would rather see the United Nations go and take over the moon. I have not seen anybody suggest that. Why don't we put in a substitute motion at the United Nations saying "Let them have the resources of the moon." But let's not get into this business of getting down to the bottom of the sea and letting them have that.

Mr. GROSS. The moon would be a good place for it—the United Nations, I mean.

Mr. ROGERS. So in conclusion let me say I hope that the committee will go into this very thoroughly. I am very hopeful that the committee will see fit to pass out a strong resolution instructing or advising our delegation to take a strong position against allowing the United Nations to take over the sea bottoms of the world. I think it would be a great error.

You are very kind to allow me this time.

Mr. FASCELL. I want to thank my colleague for being so expressive on this subject in which he has had a great interest ever since he has been in the Congress, and has exhibited a great deal of leadership. There will be sufficient congressional review. Your own subcommittee is holding hearings on this subject from the technical and other aspects of oceanography. In this subcommittee we expect to make just as judicious and thorough a study of the subject.

The State Department is prepared to lay on the record what the position of the Government is at this time with respect to the Malta proposal. We will continue to exercise oversight on the matter because this is a matter of continuing interest.

Developments move fast and we will expect, from the foreign policy implications of it, to join with you in keeping careful watch over the entire area of the problem.

Mr. ROGERS. If I might comment there, I think it is going to be very essential for the Congress to keep very close watch on this. It was amazing to me to hear from Mr. Fountain that already there has been discussion on this business in the United Nations.

Mr. FOUNTAIN. I said there was a news story which I received when I got there about a proposed giveaway, but I started asking some questions and got some quick responses to the contrary, which pleased me very much.

Mr. ROGERS. Yes, but I think it is going to require strong congressional oversight in this whole matter or it can get quickly out of hand, as the gentleman says.

Mr. FASCELL. Let me ask my colleague from Florida: Based on your studies and those of your subcommittee, what is the position of the United States in the field of oceanography?

Mr. ROGERS. We are now, as you know, beginning to put impetus in the development of this whole subject matter which we were not doing a few years ago. The Congress has been the one that has really brought this about. I think this: In some areas we are ahead in oceanography and significantly ahead. In many areas we are not ahead, we are far behind.

Mr. FASCELL. Can you give us an example of that?

Mr. ROGERS. Yes. In the practical application of oceanography, for example. In Russia—and I visited there a year and a half ago to go into this matter—we discussed their program with some of their experts. I feel that they are far ahead of us in applied oceanography, in that they are using the science of oceanography to benefit their nation in their fisheries.

They use oceanographic vessels to do research work. They will find where the fish are, at what depth, approximately how many, how many should be fished, and so forth. Then they will bring in a ship to test out what the scientists have found. Then if it proves out the way they have found it, they call in their fishing fleet and they may have 200 vessels. They fish the area with mother ships there, and then they bring the catch right to the mother ship. They process on these mother ships right there. They do not have to take it back to Russia to be processed. They have the most advanced fishing fleets in the world.

Mr. FASCELL. I saw a model of one of those vessels and it is a fascinating sight.

Mr. ROGERS. It is. They are now fishing off of the coast of Africa with these ships right now. They have developed fish flour, fish meal. They are sending those products into the nations off the coast of Africa. They do not have to go back to Russia to process it.

We have finally persuaded the Food and Drug Administration to agree that fish flour is all right. The reason they didn't want to approve it is it wasn't esthetic enough for the American people. Really, it is probably some conflict with domestic industries. Nevertheless—

Mr. GROSS. May I observe that there is an excellent movie available of the operation of these Russian fishing fleets, with their processing facilities, at sea. It shows the whole course that they take.

Mr. ROGERS. Yes, and it is fantastic. Also they are transplanting fish from one sea to the North Sea. They are transplanting salmon and the king crab.

We are doing many practical things. I think we are probably ahead of them in deep sea work. In fact, I am sure; but here is an area where

they are trying to catch up. Another area we are going to have to watch is weather control, which ties in very definitely with oceanography. The knowledge of oceanography also is pertinent here. The new Director of the Institute of Oceanology in Moscow, which is their main Institute, comes from that background of knowledge and his whole work has been in the interaction of the air and sea for weather control. We are just going into that this morning in some discussions with Dr. White of ESSA.¹ We need to do greater work there because if we do not, we are going to see Russia move right ahead in control of the weather. When you start controlling the weather you are in a very powerful position.

Mr. FASCELL. I agree with the desirability and necessity of the studies which the gentleman is talking about. I want to thank you for putting the specifics on the record. This is kind of, I guess, a fundamental difference: The Russians are always emphasizing applied research in all fields, not just oceanography, as against the approach of a balanced program, both applied and basic, which we use in the United States.

I am not sure the Russians are right but I would have to agree in certain areas of applied research, both in oceanography and in behavioral sciences they have made tremendous strides. I wouldn't write off basic research, however. Would you?

Mr. ROGERS. Definitely not; this must be done, this is fundamental.

Mr. FASCELL. The other note I want to add, of course, that tremendous emphasis is being placed now at the Oceanographic Center in Miami, and in the south Florida region, on studies of the interaction of the atmosphere and water. We expect to make great strides in these studies.

Mr. Fountain?

Mr. FOUNTAIN. No questions, Mr. Chairman, other than to commend the gentleman from Florida for appearing before this subcommittee. I compliment him on his thought provoking statements.

Mr. FASCELL. Mrs. Bolton?

Mrs. BOLTON. Thank you, Mr. Chairman.

I have no questions.

Mr. FASCELL. Mr. Fraser?

Mr. FRASER. Thank you.

I want to commend my colleague for his appearance here this morning and the information which he has brought to us.

I gathered from your statement that your view of the question of the disposition of the sources of the sea is that national sovereignty should extend, in the case of the Atlantic, out to the mid-Atlantic.

Mr. ROGERS. For exploitation.

Mr. FRASER. Well, also in defense.

Mr. ROGERS. Yes, this is right.

Mr. FRASER. You said defense?

Mr. ROGERS. This is right.

Mr. FRASER. That is, defense of that occupation of that part of the sea?

Mr. ROGERS. Well, I think if you are going to be able to occupy it, you are going to have to be able to defend it.

¹ Environmental Science Services Administration.

Mr. FRASER. You talk first about exploitation.

Mr. ROGERS. Yes, to be able to occupy and defend it.

Mr. FRASER. What you mean to say is that we would assert sovereignty over it for all purposes incident to exploitation and be prepared to defend it?

Mr. ROGERS. That is correct.

Mr. FRASER. Therefore, there is no role for any international body to play in the situation?

Mr. ROGERS. I don't say there is no role for the international body, but not as to the sovereignty of the sea bottoms. I do not want an international body to come in when present law allows us to extend the borders of this Nation just as we did when we went west.

We did not have any international body to tell us whether we could go there or not. It was land that had not been developed.

Mr. FRASER. So that I may get clear in my mind this situation, as between the United States and Cuba, how far would you say that our sovereignty would go?

Mr. ROGERS. Well, as I understand it, under the Geneva Convention you go out to a midpoint. You could go out to a midpoint between nations just like, I presume, they are trying to do in the North Sea. They are trying to work this out bilaterally.

Mr. FRASER. The problem I find with this convention is that it extends the continental shelf beyond the 200-meter depth to those depths which admit of exploitation of the natural resources of said area.

Mr. ROGERS. That is right.

Mr. FRASER. What that suggests is that there is a changing limit because the technology changes.

Mr. ROGERS. Yes.

Mr. FRASER. However, the same convention goes on to say that these rights are exclusive and even if you have not exploited them they are still yours.

Now, do I understand your position is that there is now a sufficient technology so that the United States is in a position to flatly declare that it can go to the mid-Atlantic point and assert its rights to the exclusion of all others?

Mr. ROGERS. I don't think any nation is yet in that position. I don't think we will be probably until 1980. I have suggested that we set this as a national goal for oceanography—occupation of the mid-Atlantic range by 1980.

Mr. FRASER. In any event——

Mr. ROGERS. Here is what I am saying: The Geneva Convention says you can go out as far as you can exploit, out to the midrange, say, off of the shelf beyond the 200-meter limit depth. Now, as we develop the technology to occupy and to be able to defend that, I think we ought to have that right and not be blocked by the United Nations coming in and saying "Oh, no, you cannot do that. We own all the sea bottoms." They will not have the technology to do it. That agency has no capability. It is not an exploiting agency. So it ought to be left to the individual nations, off their own coasts, to do this.

Mr. FRASER. In any event, your ultimate view of the resources of the sea is that they are divided up among nations?

Mr. ROGERS. Yes. That is present law, I think.

Mr. FRASER. In accordance with the——

Mr. ROGERS. Geneva Convention.

Mr. FRASER. In accordance with the Geneva Convention?

Mr. ROGERS. Certainly.

Mr. FRASER. Which would mean that landlocked nations had no rights at all to the exploitation of the sea?

Mr. ROGERS. That is right. This is exactly what I believe.

For instance, I do not know how many claim ownership of the moon.

Mr. FRASER. I think we have made some disposition of that now through an international agreement.

You are suggesting we should substitute. I think this has been the subject of discussion.

Mr. ROGERS. To give every nation a portion?

Mr. FRASER. My understanding is this—and I would be quite willing to be corrected—we have in effect said that no nation may make a territorial claim to the moon.

Mr. ROGERS. No claims of sovereignty.

Mr. FRASER. Yes, of the kind that sovereignty implies, which is that you have certain rights to the exclusion of others. So we have done what you have suggested; that is, we have dealt with the subject; maybe not the way that you would have preferred we divide it up.

Mr. ROGERS. I think not, really. When you say no nation can make a claim of sovereignty, are you saying that it is thereby transferred to the United Nations?

Mr. FRASER. What I understand is that it does, basically, define national rights with respect to the moon, which is to say that no nation may assert any rights to the exclusion of other nations and that no one may acquire sovereignty over any portion of it. Now, this is a layman's understanding of it.

Mr. ROGERS. Would this apply to Red China, which is not a member? She is now developing nuclear power. Maybe they are going to have a rocket soon.

Mr. FRASER. I assume that Red China would have to make its own decision as to whether it was bound.

Mr. ROGERS. True. That is what we are saying: That every nation ought to make its own decision and let's not have the United Nations do it.

Mr. FOUNTAIN. Would you yield?

Mr. FRASER. Yes.

Mr. FOUNTAIN. Mr. Rogers, I do not understand you to mean that, notwithstanding these rights which have been established, just as we have relations in our Federal system between local, State and Federal governments, that you would not agree that this is an area where there should be international cooperation and discussion and exploration?

Mr. ROGERS. Yes.

Mr. FOUNTAIN. In the interest of all nations of the world, not just ours?

Mr. ROGERS. Yes, because I think existing international law has that effect. I am talking about the sovereignty to sea bottom and the minerals therein or thereon.

Mr. FRASER. Thank you.

Mr. FOUNTAIN. Thank you.

Mr. FASCELL. Mr. Gross.

Mr. GROSS. Thank you, Mr. Chairman.

To start with, I would like to call attention to my resolution, House Joint Resolution 835 on this subject and read the resolving clause:

That the Congress of the United States memorialize the President to instruct American representatives of the United Nations to oppose any action to vest control of the resources of the deep sea beyond the Continental Shelves of the United States.

I will say for the edification of my friend from New Jersey, there is no time element in the resolving clause of my resolution.

Mr. FRELINGHUYSEN. If you will yield, I am relieved to hear this because it did seem if Mr. Gross were endorsing this resolution he would certainly be indicating that there is a responsibility for the United Nations. It shows, as I would have expected, that the gentleman from Iowa has done his homework and has come up with a strong anti-United Nations resolution.

Mr. GROSS. At least up to a certain point. I might suggest that although I am a Republican, my resolution might be substituted for the Democratic resolution. I won't insist on it, but I just suggest it.

Mr. FASCELL. That is all right; I won't insist either.

Mr. GROSS. The gentleman from Florida, Mr. Rogers, should understand that he may be denounced in some quarters for having pointed out how this great Nation of ours was developed. That is old fashioned, and not in conformance with the welfare state, the gentleman should understand that.

I want to commend the gentleman for his position and for the statement that he has made this morning.

Mr. ROGERS. Thank you.

Mr. FASCELL. Mr. Roybal.

Mr. ROYBAL. Mr. Chairman, for the purposes of further clarification we have received at least two recommendations as to what this committee can do.

The way I understand the recommendation that you have made, you have recommended that this committee take a strong position against the Malta proposal now or at any time; is that correct?

Mr. ROGERS. I don't know what position it will want to take. That would be a decision of the committee after going into it. But I do think the immediate problem is the Malta resolution and that is what I was trying to address myself to. At this time, we certainly want to make sure that the Malta resolution makes no headway in the United Nations.

Then I think you are going to have to deal with other situations as they may come up.

As the chairman has said, you will want a continuing oversight over this entire problem. It would be essential.

Mr. ROYBAL. The other situations you make reference to would be, then, the proposal at the present time that a study continue until next year when they will make a report and perhaps this committee can at that time make a determination as to what recommendations it would make.

Mr. ROGERS. I think you can go ahead and make a recommendation now that you do not want the Malta resolution. I would hope you would.

Then you can determine, as other studies may come in, what you want to do. Another thing you might be interested in is the fact that we set up a commission to go into the study of this entire problem of oceanography and to set our Nation's goals, where we should go. This would be very significant, I think, too, when this commission's report comes out. We anticipate probably in a year or a year and a half.

That may well have some significance on the position our Nation will want to take after our own people have studied this. We are in the process now of just saying or seeing how far we want to go in this Nation.

Mr. FASCELL. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I must say I am somewhat disturbed by some of your statements, Mr. Rogers.

To begin with, your suggestion that the Russians might be able to control the weather and that we ought to catch up with them strikes me as an unhappy development, to say the least, unless our catching up would mean that we could keep them from controlling the weather.

If, for example, the Russians could throw a hurricane at the coast of Florida and we could retaliate by throwing some bad weather over Moscow, it seems to me we are not moving in a profitable direction.

Mr. ROGERS. I would think this: I hope the gentleman is disturbed about this because it is a very real danger. Of course, what we want to do is to have the technique to dissipate such a hurricane. As you know, very significant work is going on in this area to be able to dissipate hurricanes and properly forecast when something may happen that we could deal with in areas where people would be at least prepared for it.

Right now they are doing great work in trying to seed hurricanes. This offers a great deal of hope, not only for control, but for the control of tornadoes as well. So we must do some work along these lines. It is not impossible that this could eventually happen.

Mr. FRELINGHUYSEN. If we are talking about Soviet-inspired or developed hurricanes, I should think the best defense would be a strong offense. Maybe we should not only worry about dissipating their hurricanes, but we should develop some of our own that they will have difficulty dissipating.

Mr. ROGERS. I think any knowledge on the control of the weather might lead you to that conclusion, knowing how to form something as well as how to dissipate. How to form rain, for instance. This will be very significant, not just in dealing with another nation perhaps, but for our own farmers, if we could bring rain at proper times. This is not beyond possibility. I think it will not be too long before we will be able to do something in this area. But we cannot just sit aside and say "We hope the United Nations is going to handle it all" and forget it. It just cannot be done that way.

We have to have a capability to meet whatever Russia may do because I can assure you they are moving ahead in this area.

Mr. FRELINGHUYSEN. I do not assume that anybody is suggesting that we give up our capability to do things and hand them over to the United Nations.

Mr. ROGERS. Right.

Mr. FRELINGHUYSEN. I was also a little surprised about your prospect of underground cities off our shores. I would think it would mean we would not benefit from the Florida sunshine if we had to go under water. Of course, if you did that you would avoid the air pollution.

Mr. ROGERS. We hope that you will come to Florida to go offshore there. They are the most beautiful waters in the world.

Mr. FRELINGHUYSEN. I hope to come to Miami next year, but I do not expect to go under water any longer than I can help.

Mr. FASCELL. If you would yield, at least you should bring your aqua lung.

Mr. ROGERS. I predict the gentleman will be doing that in about 10 years, maybe even at Palm Beach when you come down there. You will have dinner in a restaurant at Palm Beach under water. May I say they already have one under Hawaii.

Mr. FRELINGHUYSEN. I obviously should travel more, if I get the opportunity.

I should like to develop your concept of what the role of the United Nations should be. As I understood your statement, you made a very strong case for doing nothing that would interfere with what might well be an aggressive development program on the part of the United States. You do not thereby mean that there is not any role for the United Nations, for example, in determining, as between interests of different countries, all of whom may have a claim, or several of whom may have aggressive development programs, do you?

Mr. ROGERS. Well, I think this: The law is already established that we may do this if we have the capability of exploiting. I think this is the law.

Mr. FRELINGHUYSEN. As to any further developments with respect to this—

Mr. ROGERS. I think if you want to discuss some problems, the United Nations can be helpful in discussions. But as to taking over title of these sea bottoms, I would oppose that.

There are many areas of international law that will continue to be dominant in, for example, fishing, in the use of the sea, free passage, many areas. But what we are directing our thoughts to is the Malta resolution which would allow the United Nations to take those sea bottoms. I just feel that this should not be done. It forecloses us.

Mr. FRELINGHUYSEN. It is still not quite clear to me what exploration our country might engage in, and what it would result in. Would this mean the development of sovereignty out as far as we were able to exploit? Is that what you have in mind?

Mr. ROGERS. Yes, out to a midrange between nations.

Mr. FRELINGHUYSEN. In other words, we would develop national sovereignty as far as we could reach?

Mr. ROGERS. I would hope we would extend the borders of this Nation on the sea bottom, as such, as part of our national sovereignty just as the Continental Shelf is to a certain area.

Mr. FRELINGHUYSEN. Suppose as a definition of the national goals to which you referred we decided we want all the undersea waters to the Azores, say, in the Atlantic. Suppose we wanted to go out at least as far as the Hawaiian Islands or maybe Okinawa in the Pacific. Would we therefore stake a claim of some kind? Isn't this the kind of

trouble that we might well try to avoid, recognizing that there are other competing national interests?

Mr. ROGERS. I think it will have to be done by whether the other nation would reach the midborder of whatever area you are trying to exploit.

Mr. FRELINGHUYSEN. You think——

Mr. ROGERS. You have to deal with them. In many areas it will be a multi-nation sort of thing. Maybe discussion of the member nations, I think, is a way to approach it. This is evidently being done now in the North Sea.

Mr. FRELINGHUYSEN. You mean, it is just a question of discussion between those nations capable of making these explorations?

Mr. ROGERS. Those who are involved and whose borders actually touch the area.

Mr. FRELINGHUYSEN. And you think the resources, the undersea resources, should belong automatically to those who are able to exploit them?

Mr. ROGERS. Yes, very definitely; and to the nation that it borders on.

Mr. FRELINGHUYSEN. It is not a question of bordering on.

Mr. ROGERS. Yes, it is.

Mr. FRELINGHUYSEN. If you are out a thousand miles into the sea, it isn't a border situation.

Mr. ROGERS. Yes, it is, because it starts from your shoreline.

Mr. FRELINGHUYSEN. It either does or it doesn't. You might go off some other shore than your own.

Mr. ROGERS. No.

Mr. FRELINGHUYSEN. To develop the resources there.

Mr. ROGERS. No. Under the law, this does not give you the capability of doing that. This is from the coastal areas.

Mr. FRELINGHUYSEN. You are assuming something sacrosanct about this convention.

Mr. ROGERS. I am saying it is present law and I do not see anything too wrong with it.

Mr. FRELINGHUYSEN. I am saying that you could go off someone else's shore and go down underneath. This would be forbidden?

Mr. ROGERS. That does not give you the title to the land.

Mr. FRELINGHUYSEN. Why not?

Mr. ROGERS. Unless it is a contiguous area starting with your shore.

Mr. FRELINGHUYSEN. It is contiguity, in your opinion, no matter how far out, that develops legality?

Mr. ROGERS. Up to a midrange, and the possibility that you can yourself exploit it. That is what the conference says.

Mr. FRELINGHUYSEN. In other words, it goes up to the middle of the Pacific Ocean or the middle of the Atlantic Ocean?

Mr. ROGERS. Yes, I think this would be true.

Mr. FRELINGHUYSEN. How far off, say, the Mexican coast?

Mr. ROGERS. Probably a midrange there in the gulf. You would take a midpoint. It will have to be worked out between the two nations. This is not difficult.

Mr. FRELINGHUYSEN. Mexico might not have the capacity at all at the moment to get out beyond the continental shelf.

Mr. ROGERS. They assume whoever finally gets the technique of exploitation, it almost assumes that every nation can then do it. I believe that is the assumption.

Mr. FRELINGHUYSEN. Do you want me to yield?

Mr. FRASER. Yes.

Mr. FRELINGHUYSEN. Very well.

Mr. FRASER. The dream of U.S. exploitation of agreement on the mid-Atlantic, under this convention has evaporated because it would permit the Atlantic to be under the possession of Bermuda, the Azores, and the Canary Islands.

Mr. ROGERS. To the midpoint.

Mr. FRASER. We could get out halfway to Bermuda and that would end our jurisdiction.

Mr. ROGERS. Bermuda is only an island, I would point out.

Mr. FRASER. Under your definition, this is the result.

Mr. ROGERS. You would have a radius from that island that would go out.

Mr. FRASER. What you do is you plot the points that are equidistant from both.

Mr. ROGERS. In some areas it will come in, in some it will go out.

Mr. FRASER. Yes. But I think if you plot it out on the map and you plot out the jurisdiction of the Azores and Bermuda you will find that most of the mid-Atlantic has disappeared, that we have no rights.

Mr. ROGERS. I would not agree with you.

Mr. FRASER. I have the map here if you would like to look at it. This is what happens.

Mr. ROGERS. I see the map over here on my right.

Mr. FRASER. I am only trying to suggest that the reliance on this convention leads to results which I think you would regard as absurd.

Mr. ROGERS. No, I do not think so. I think this probably can serve as a basis.

Mr. FRASER. Now, Hawaii, if she should secede, she would take control of the Pacific, or most of it, maybe midway to the Marianas.

Mr. ROGERS. Well, if it is the midway point. This is present law.

Mr. FRASER. But it is law, of course, which contemplated a technology which only reached out a limited distance. Now you are suddenly saying this is quite satisfactory in view of a whole new dimension of technological development. I am saying most people would regard the results as absurd.

Mr. ROGERS. I think most people have not thought of the capability of what may happen.

Mr. FRELINGHUYSEN. At least this discussion shows this is not a simple problem and there might well be a need for some kind of arbitration between competing national interests.

Mr. ROGERS. No question about it.

Mr. FRELINGHUYSEN. Are you accepting the fact that there might be a need for the United Nations to serve as an umpire, a forum, or even an adviser as to what might be done with respect to this?

Mr. ROGERS. I do not know that we have to have the United Nations advise us on bilateral treaties. Do we? Or even multilateral treaties. I think this Nation is capable, and other nations are capable.

Now, maybe the United Nations can make a contribution in the way of suggestions. But I think this Nation is capable, with other

nations, of working out a bilateral or even multilateral treaty where there are more than two nations to deal with.

Mr. FRELINGHUYSEN. Could I ask you about the language of your own resolution? Mr. Gross seems to have modified certain passages in the resolution as it was introduced by most of you. I notice in the resolving clause it says:

It is the sense of Congress that any action at this time to vest control of deep ocean resources in an international body would be premature and ill advised.

Now, is it your feeling that any action at any time to vest control of deep ocean resources would be premature and ill advised?

Mr. ROGERS. This is my present feeling. I think we are going to have to wait and see what the developments are. Certainly, we ought to take this position now, I think.

Mr. FRELINGHUYSEN. Does your resolution limit itself to action at this time?

Mr. ROGERS. I think it is the same as Mr. Hanna's resolution.

Mr. FRELINGHUYSEN. Because that language might well imply that at an appropriate later time it would be well advised.

Mr. ROGERS. I do not think that is the intention at all. I do not think that implication should be read into it. I think it was simply put in so that the committee would not have to meet the problem now of what to do later. Let's just meet the problem now of the Malta resolution.

Mr. FRELINGHUYSEN. Mr. Hanna described as the final straw the news that the Malta resolution would be inscribed on the agenda of the General Assembly meeting now.

Mr. ROGERS. Yes.

Mr. FRELINGHUYSEN. So you are really aiming at this particular resolution?

Mr. ROGERS. Yes; in the hope that we are going to oppose it. This is really the intent, to try to stop this movement.

Mr. FASCELL. Any other questions?

Mr. GROSS. Just one, Mr. Chairman, unless it opens up a discussion.

Under the public law dealing with the offshore oil, if title is extended out into the Atlantic would the States of Florida and New Jersey among others get all the benefits?

Mr. ROGERS. No.

Mr. GROSS. Or would you share with us out in Iowa some of the fruits of your acquisition?

Mr. FRELINGHUYSEN. Why should we?

Mr. GROSS. That is the way it was handled under the offshore oil deal.

Mr. ROGERS. I might say that Iowa has already benefited.

Mr. GROSS. From what?

Mr. ROGERS. To the extent of royalties paid into this Nation to the extent of about \$2.7 billion. These royalties were paid into the United States from the oil and mineral rights.

Mr. GROSS. But not to the extent that the States on the coastal areas have benefited.

Mr. ROGERS. You would agree we should have some better rights?

Mr. GROSS. I don't know as I would agree with that.

Mr. FASCELL. I don't know that there is any equation between the viewpoint of a landlocked State and a landlocked country, but what

is that old expression about one's position being determined by whose ox is being gored?

Mr. GROSS. That is the way it was handled in the offshore oil legislation.

Mr. FRELINGHUYSEN. If I only had realized that New Jersey could really claim title to half the undersea resources to Bermuda, I might have had a different attitude toward this offshore oil situation.

Mr. FASCELL. Thank you very much. We appreciate your giving us the time.

Mr. ROGERS. Thank you.

Mr. FASCELL. Patiently standing by to express the views of our Government, we have our Deputy Assistant Secretary of State for International Organization Affairs, the Honorable David H. Popper. The discussions were lengthy and I hope helpful but we do appreciate your patience here this morning.

We are delighted to hear from you now officially as to the views of our Government.

STATEMENT OF DAVID H. POPPER, DEPUTY ASSISTANT SECRETARY OF STATE FOR INTERNATIONAL ORGANIZATION AFFAIRS

Mr. POPPER. Thank you, Mr. Chairman. Far from taxing my patience, I must say it has been an extremely illuminating discussion, it seems to me. It not only indicates the great interest of many Members of Congress, as does this hearing itself, but it indicates, I think, a kind of serious probing for the way in which we should get into what is really, as has been said, a new round, a new area, where so many unfathomable discussions—to use a term that has some connection with oceanography—may occur and where we all realize the need for caution and prudence and a lot of careful thought before we foreclose any options at all.

I have a statement, Mr. Chairman, which takes about 10 minutes to read and I would like to ask you whether you would rather have me summarize it or read it all.

Mr. FASCELL. Take your time, Mr. Popper; proceed as you wish.

Mr. POPPER. All right.

Mr. FASCELL. If we can get everybody to listen now we will be all right.

Mr. POPPER. In that case I will read it.

The subcommittee has requested the views of the Department of State with respect to H.J. Res. 816 and similar resolutions in opposition to vesting title to the ocean floor in the United Nations. I appreciate the privilege of appearing before the subcommittee to discuss these resolutions and to indicate the attitude of the Department of State to them.

In recent years there has been a marked upsurge of interest in marine science, as the vast potential of the oceans for the well-being of mankind has come to be more fully recognized. This interest has been manifest in the United States: the 89th Congress responded to it by passing the Marine Resources and Engineering Development Act of 1966 to provide the framework for expanded marine science activities.

Marine science has devoted increasing attention to the deep ocean areas, which for so long were little known and hardly explored. New developments in science and technology now enable us to work in the ocean depths as we never could before. Today we can reach the deep ocean floor; tomorrow our knowledge of what is on and beneath that floor will be significantly broadened. Already we have reason to believe that, some day, we may be able to tap significant sources of wealth beneath the deeper seas. Already we know that activities on and near the sea bottom can have national security implications. We can expect continuing exploration of the frontiers of the lower depths, designed to increase the range of our knowledge and of our capacities for scientific as well as economic and security purposes.

Up to the present this new environment beyond the continental shelf has required no system of regulation or control. As we penetrate the deep ocean and its floor, new problems are bound to arise. It is entirely logical that—dealing as we are with areas beyond the jurisdiction of national states as conceived in the past—the United Nations should be concerned with the subject. Just as the United Nations was utilized in connection with the penetration of outer space, so it is natural for it to be utilized in international consideration of the problems of the deep oceans. There are many differences between these two realms, to be sure; but they are both areas of multilateral and international concern, and, we may hope, of continuing international cooperation.

In fact, United Nations interest in the problems of the sea is nothing new. The high seas and the resources of the deep have historically been treated as international in character. In the fifties, after extensive work by the United Nations International Law Commission, a number of important Law of the Sea Conventions were adopted at a conference held in Geneva in 1958. One of those conventions deals with the Continental Shelf. It gives to coastal states sovereign rights for the purpose of exploration and exploitation of natural resources of the shelf, and it defines the shelf as the sea bed adjacent to the coast and beyond the territorial sea "to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas."

In 1958, when the treaty was signed, this seemed an adequate prescription for the off-shore activities of the participating states. Today we are turning our attention increasingly beyond the continental shelf, and there is a felt need for additional guidance with respect to the deep sea floor.

In the United Nations, a number of bodies have been studying marine problems from various points of view. The Food and Agriculture Organization (FAO) has been concerned with the development and conservation of fisheries. The United Nations Educational, Scientific, and Cultural Organization (UNESCO), through the Intergovernmental Oceanographic Commission (IOC), has encouraged scientific activities in the field of oceanography. The World Meteorological Organization (WMO) has looked into the influence of the oceans on the weather. The United Nations Economic and Social Council (ECOSOC) has requested the Secretary General of the United Nations to make a survey of the present state of knowledge of the resources of the sea beyond the continental shelf, excluding fish, and of the techniques for exploiting these resources.

Last December, the United Nations General Assembly endorsed this study and asked the Secretary General to undertake in addition a survey of activities in marine science and technology, including that relating to mineral resources development, undertaken in the United Nations or by member states and private bodies. The Secretary General was directed to formulate proposals for expanded international cooperation in marine science and development and for improved marine education and training programs. The Secretary General's report will be made to the 23rd UN General Assembly session, just a year from now.

One of the most spectacular aspects of the new oceanography is the prospect of the exploitation of mineral resources under the ocean depths. Responding to this development there have been a number of rather striking proposals regarding these resources. The most recent proposal is that of the representative of Malta in the United Nations, Ambassador Arvid Pardo, introduced for consideration at the current General Assembly Session.

Briefly, the Maltese proposal looks toward a treaty which would reserve the ocean floor for peaceful purposes, establish an international agency to assume jurisdiction over the deep ocean floor and its resources, and set aside revenue from the exploitation of the ocean floor for the benefit of developing nations.

Like the other proposals on this subject, both governmental and nongovernmental, the Maltese suggestion is an interesting approach to a widely recognized problem. We are fully studying its implications, as we have been studying the implications of other approaches. There seems no doubt that the various plans in this field reflect the relative absence of international law with respect to the use of the deep ocean floor.

Interesting and suggestive as these ideas are, we would consider it quite premature at this stage to espouse any particular type of arrangement for the deep sea bed or to make any commitments with respect to a definitive legal regime for the ocean floor.

We still know very little about this new environment. An intensive process of study and discussion will be required before we shall be in a position to express definitive views. The U.S. Government is still in the process of developing its own policy objectives through the Marine Council Act of 1966. Consequently, we could not support the treaty envisaged by Malta.

Thus, the Subcommittee may be sure that we do not intend, in the course of consideration of the question in this General Assembly, to dispose of title to the deep sea bottom, either to the United Nations or to any other recipient. We have made no agreement, disclosed or undisclosed, with any foreign government or international organization purporting to dispose of the deep ocean floor.

We do intend to press onward with the acquisition of knowledge and the development of legal studies regarding the ocean floor. We shall do what we can to encourage scientific research on a national and international basis, at an increasing tempo. We shall be alert to any questions of national security, to the legitimate interests of industry, and to the importance of maintaining the traditional freedoms of the sea. We are aware of the promise which the oceans hold for the benefits of man.

In the light of these considerations, I would suggest that it may not be necessary to proceed with House Joint Resolution 816 and similar resolutions, as these are now framed. We stand at the beginning of a rather lengthy process of international discussion on this subject. As that discussion is carried forward, we shall consult fully with the Congress with respect to any proposals the United States contemplates making in this field.

Mr. FASCELL. Thank you, Mr. Popper.

I appreciate having on the record your explicit statement with respect to the position of this Government. It seems to address itself to all the questions which have been raised here by the resolutions and by those who have testified prior to your testimony.

Having said that I agree thoroughly with the position of the Government, I find some, shall I say, inconsistencies in your statement. You said on the one hand that we are dealing "with areas beyond the jurisdiction of national states as conceived in the past." But you also said that "there seems to me no doubt that various plans in this field reflect the relative absence of international law with respect to the use of the deep ocean floor."

If you had said "title," I might question that. You said "use of" and that is entirely different from "title." Presumably, the Convention on the Continental Shelf covered that subject. But it didn't completely. That raises a whole series of questions in my mind without getting into the philosophy of what is international law and how it is made.

Going back first to that convention, obviously any country that is not signatory to this convention cannot be bound by it. Is that correct?

Mr. POPPER. That is correct, Mr. Chairman.

Mr. FASCELL. Therefore it is doubtful that the coastal state which is a signatory to the convention can give itself anything. They might try to provide for the settlement of any conflicting claims that might exist between them. These are resolved theoretically in this convention, are they not? They cannot be resolved by someone not signatory to the convention?

Mr. POPPER. Mr. Chairman, might I make a short comment in responding to the thrust of your inquiry? The Convention on the Continental Shelf is, of course, governing with respect to those, as you say, who have ratified it. I think there are 37 at this time. This is for the area it covers and in the way stated in the convention itself.

Mr. FASCELL. That is pretty explicit, by the way, since you quoted it exactly in your testimony.

Mr. POPPER. I think the problem is, Mr. Chairman, that the convention does not appear to intend that the continental shelf could be extended by exploitation indefinitely out into the ocean.

I call your attention to the words "adjacent to the coast," and so on.

Mr. FASCELL. I thought it said "to where the depth of the superjacent waters admits of the exploitation." I don't notice any limitation in that language at all.

Mr. POPPER. If you look at article I of the convention, Mr. Chairman, you see the words "adjacent to the coast" at an earlier portion of the same sentence.

I am not a lawyer and I would not like to make a definitive judgment as to this but simply to say we have the feeling that there is a certain ambiguity in the reach of the convention, and that this is a subject for further international consideration in the light of the developing interest in the deep ocean bed, as Congressman Rogers stated.

Mr. FASCELL. I realize your position. The thing that intrigues me is why the United States, as a signatory, would raise the question of the ambiguity. I have not noticed any nonsignatory nation raising the question of the ambiguity or in any way contesting the convention. It would seem to me any nonsignatory could contest the convention on many grounds unless, by international law, the right of prescription to a signer resulting from nonaction, nonclaim or nondefense of a nonsigner establishes a prior right. Certainly for the United States to raise a question with respect to an interpretation and putting its own interpretation on it without any reason to do so seems to me to be unnecessary and premature.

Mr. POPPER. We are not attempting at this time to make definitive statements as to what the convention does or does not say.

Mr. FASCELL. All right. Therefore, there should be no intention and no inference read into the remarks in your testimony that the United States is intending to interpret the Law of the Sea Convention on the Continental Shelf.

Mr. POPPER. This was not the intention, Mr. Chairman. The intention was to explain an existing situation and to explain why the interest in this subject had been created and precisely the direction it has taken.

Mr. FASCELL. I want to be explicit on the record now. I understand that nothing that you have said should in any way be interpreted as an official position or interpretation by the United States as to the terms or rights of the convention.

Mr. POPPER. That is quite correct.

Mr. FASCELL. Because it seems to me there are important precedents set forth here which should be extended. I am not talking about jurisdictional rights now, but rights under this convention which already have been resolved. Obviously if there is consideration to be given to another international agreement, thought must be given to either rewriting the present convention or in some way modifying it. I don't know whether the United States is prepared to take a position on that yet. If the U.S. position is to hold open for a flexibility of alternatives, then we certainly ought to do it with respect to this convention as well as with regard to the Maltese proposal.

Mr. POPPER. I agree, Mr. Chairman. I didn't want to call into question the existence or validity of this convention but simply to point out that despite the convention there are still problems not entirely covered by it.

Mr. FASCELL. You have made that clear to me and I am delighted to have that explanation on the record.

Mr. Fraser?

Mr. FRASER. I am sorry I have had such difficulty. I have a very short memory.

What is the status of the moon?

Mr. POPPER. The outer space treaty states that outer space and celestial bodies shall be used for the benefit of all and that there shall

be no claims of sovereignty in outer space or on celestial bodies. The treaty does not vest title in anybody.

Mr. FASCELL. It could not very well, could it?

Mr. POPPER. Nor does it state how exploitation should be carried out, if you could do it on the moon. It is silent on those points.

Mr. FRASER. I was asking Congressman Rogers about the effect of these articles. As I read the continental shelf definition, where there are states that are opposite each other, my impression was that you took a line that was created by those points which lay equally distant from the opposite coasts.

Mr. POPPER. There is language of that kind in the convention, yes.

Mr. FRASER. So it would appear Bermuda would carve out a very large section of the Atlantic, and at the other end—if you start drawing median lines, midpoint lines, or whatever they are called—using the Azores, you take out a big chunk at the other end of the Atlantic.

It is technology extended indefinitely, so if one came into the question of how this functions you would have considerable difficulty? A very small island could have a very big piece of the ocean depending on how far away it was.

Mr. POPPER. If you look at article VI of the convention I think it tends to support that kind of view.

I would suggest, Mr. Chairman, if someday you pursue these hearings, that you might wish to hear from legal specialists on this range of problems because it is a very intricate subject, indeed.

Mr. FASCELL. We will.

Mr. FRASER. Literally applied, then, one square foot of territory representing an island could have an enormous impact on who has sovereign rights to the sea bottom, assuming technology is that far advanced. It would seem to me to be a wholly unacceptable result to the international community to make a small island where nobody lived a matter of great international significance.

Just speaking for myself, I want to say that I hope our country will try to approach this problem with a spirit of trying to build patterns of international cooperation. It is my opinion that this is most clearly in the national interest of the United States. Because we are such a powerful nation we think we can disregard the need to build international cooperative patterns. It seems to me in the long run we will suffer unless we do this.

I agree with the chairman. There is much in the Maltese resolution which deserves very serious consideration. I am a little weary of war and the enormous drain on the emotional and economic human resources of our country as well as that of others.

Thank you, Mr. Chairman.

Mr. FASCELL. Mr. Gross?

Mr. GROSS. If I may be permitted an observation concerning the Maltese resolution, the best thing it has accomplished to date is to put us on notice of what may be taking place. That is the only credit I want to give the Maltese action.

On page 6 of your statement, Mr. Popper, second paragraph, you say:

Thus, the Subcommittee may be sure that we do not intend, in the course of consideration of the question in the General Assembly, to dispose of title to the deep-sea bottom, either to the United Nations or to any other recipient.

When you read your statement you inserted the word "this" before "General Assembly." Was this inadvertent or was it deliberate that you changed "the" to "this"?

MR. POPPER. I am glad you caught that point, Congressman, because I did change it, and I have written it in there. The reason I did that was this: The scope of this discussion I think is how we handle the Malta proposal as it now stands—the explanatory memorandum and a proposal for the Assembly.

What I was trying to say, and I wanted to make it explicit, was that we have no intention of taking substantive action on this proposal at this time. We would like to leave, as I indicated in the general thrust of the statement, options open for the future. I am frank to say I don't know what might happen 10, 20, or 30 years from now. I wouldn't want to pronounce either way on a subject of this kind.

MR. GROSS. Then you deliberately changed "the" General Assembly to "this" General Assembly?

MR. POPPER. Yes, sir; in the spirit I indicated.

MR. GROSS. In the last of your statement you say, on page 7:

We shall consult fully with the Congress with respect to any proposals the U.S. contemplates making in this field.

Will you consult with Congress before the fact rather than after the fact? At what stage do you propose to consult with Congress?

MR. POPPER. I think this, too, is a very——

MR. GROSS. I might add before you proceed that we have had some very unpleasant experiences with some people in the State Department in taking us into their confidence after the fact.

MR. POPPER. I should like to be quite explicit as to exactly what one can and cannot do in these circumstances.

When you are in New York, as Congressman Frelinghuysen knows from experience, and Congressman Fountain will find out, and Congressman Fascell knows, some things develop tactically in a very rapid way. Obviously if we are to change a line or a word one day on a day's notice to stop something else happening which is worse, it simply is not feasible to consult in that sense.

What is meant here is that in terms of major substantive proposals we will on this, as we do on all major substantive proposals, consult fully with the Congress before we make them.

MR. GROSS. The chairman of this subcommittee is not one of the real junketeers around this place. He is here and he has a telephone. He can be reached on very short notice. He is in constant attendance when Congress is in session, and I assume he can probably be reached in Florida on short notice, when Congress is not in session.

MR. POPPER. I take full note of that statement, Congressman. In addition I want to point out, in the presence of Mr. Fountain here this morning, that representatives of your body in the House will be in New York during the course of this session and fully read into every tactical move at every stage.

MR. GROSS. You will agree this is a tremendously vital issue, will you not?

MR. POPPER. Absolutely.

MR. GROSS. Thank you, Mr. Chairman.

MR. FRELINGHUYSEN. I would like to add to what Mr. Popper says. It happens that two members of this Foreign Affairs Committee are

representing this country at this session of the Assembly, so we could not have a better pipeline if they communicate with us, as I assume they will, on matters which they think will be of current interest to us.

Mr. Popper, I noticed in this morning's New York Times that Ambassador Goldberg has made a statement at the U.N. with respect to this Malta proposal.

If you have a formal text of his comments it might be appropriate if that were incorporated into this morning's record.

Mr. FASCELL. Without objection it will be inserted in this record. (The statement follows:)

STATEMENT BY AMBASSADOR ARTHUR J. GOLDBERG, U.S. REPRESENTATIVE, IN GENERAL COMMITTEE ON THE INSCRIPTION OF THE ITEM DEALING WITH THE PEACEFUL EXPLOITATION OF THE OCEAN BEDS—SEPTEMBER 21, 1967

My delegation has listened with great attention to the explanation of the distinguished representative of Malta, Ambassador Pardo, in support of the request of his delegation for inscription on the agenda of this session of the General Assembly of an item concerning the peaceful exploitation of the ocean beds.

Now, it must be obvious to us that this is an item of very great importance and we conceive it to be a most timely one and we are pleased to support its inscription on the agenda.

Having in mind the existence of past and future items on our agenda dealing with the "Resources of the Sea", and an item which we have already decided to recommend for inscription this year "Development of Natural Resources" which is related to this topic, I would, with your permission, Mr. President, address some general remarks so as to set forth the view of my delegation as to the context in which this item is set, and the reasons why we support its inscription.

Though man has travelled and fished on the sea for many centuries, this portion of the earth—five-sevenths of the surface of the globe—remains in many respects as strange and unknown to us as that other vast and little exposed realm of outer space. Both outer space and the sea, however, through science and technology, promise much to human benefit and both require for the fulfillment of the promise that we the nations of the world, through this organization, address ourselves to our tasks in cooperation and not in conflict.

Man's mastery of the oceans, and of all that lies beneath them, despite the use of them for so long, is still in an early stage of development. But we know already from scientific discoveries that the oceans contain immense stores of protein to add to urgently needed human food supplies. We believe that one day the floors of the deep sea can be mined for immense quantities of metals, hydrocarbon fuels, and other substances useful to mankind. We know also, though in far too little detail, how deeply the oceans affect the land—the building and erosion of our coastlines and the making of weather.

A rapid increase in our mastery of all these fields—and in the number of qualified scientists and engineers involved in them—becomes more and more urgent as human population expands at an astonishing rate and the demands of the human family for food, energy, and raw materials correspondingly increase.

In recent years many governments and scholarly organizations have made important efforts, both separately and through international organizations, to spur research on oceanography and related fields. My own government has intensified its work in this field, especially since the enactment of the Marine Resources Act of 1966. But compared to what lies ahead, all these efforts to date have been rather insignificant. Our work must be redoubled, and it must, as Ambassador Pardo has correctly pointed out, be put on a more effective international footing, if the needs of future generations are to be met in time.

We therefore strongly endorse the expanding interest of the General Assembly in this field. This organization is in a position to assume leadership in enlisting the peaceful cooperation of all nations in developing the world's oceans and ocean floor.

At the appropriate time, when we come to the substance of the matter, my delegation will have certain specific proposals to advance. What we face today, as Ambassador Pardo commented, is the procedural question as to how the Assembly is to come to grips with this complex subject.

Mr. President, we believe that the General Assembly has met with considerable success over the years in its consideration of the peaceful uses of outer space, and, indeed, one of the great achievements of the last Assembly was the consummation of the Outer Space Treaty. While recognizing a number of differences between these two harsh environments, at the same time we see certain useful similarities. We have here an item, like outer space, of which some aspects might well have been considered within the context of the Sixth Committee, other aspects in the Second Committee, concerned as it is with the subject of resources. We also noted that the delegation of Malta made a strong plea for the reservation of the ocean bed exclusively for peaceful purposes. In so doing the Maltese Delegation raises a question related to the regulation of armaments, one which may call for our most serious study.

All things considered and taking into account the very explicit language of Rule 101 which specifies the First Committee as the "political and security committee (including the regulation of armaments)" my delegation will support the allocation of this item to the First Committee.

Rule 40 reminds us that this General Committee can address itself to the question of what priority should be accorded to an item and my delegation will likewise support the early consideration of this item in the First Committee.

Mr. POPPER. I brought the statement here for this purpose. We are delighted to submit it for the record. The statement does in a broad way frame the problem. It endorses the expanding interest of the Assembly in this field. It points out that the organization is in a position to assume leadership and enlist the cooperation of all nations in developing the ocean floor.

When we come to the substance of the matter the United States will have certain proposals to advance.

The statement then turns to questions of procedure within the committee. It is certainly well to include the statement and at a subsequent time future statements which the Ambassador or his fellow delegates might be making on this subject in the General Assembly this year.

Mr. FRELINGHUYSEN. I would like to discuss this convention adopted in 1958 with respect to the continental shelf. You said it was developed after extensive work by the U.N. International Law Commission.

Mr. Reinecke referred to a Soviet proposal submitted to UNESCO for the development of a convention with respect to the deep sea resources.

How would a convention normally be developed, like the one developed by the International Law Commission or the one Mr. Reinecke referred to? What would be the normal procedure?

Mr. POPPER. The normal procedure is quite lengthy.

What I think you would do, if there were general agreement that a convention should be written, is to appoint a group of experts, specialists—in the case of the conventions 10 years ago it was the International Law Commission that did the spadework—you would appoint such a group to produce a preliminary draft. Then you would submit it either to a conference or to the General Assembly or to some other body which could put it into final form so it could be opened for signature and ratification by those nations which wished to adopt it.

Congressman Reinecke had reference to the Intergovernmental Oceanographic Commission (IOC). That body is a subordinate body of UNESCO. It has 55 members. Hitherto it has been solely occupied with oceanographic problems in the scientific sense.

The Soviets have proposed in that body that there should be a

working group set up to draft a convention on "The International Norms of Exploration and Exploitation of the Mineral Resources of the High Seas."

Our own feeling is that a body which has been and really is scientific in nature is not the body to draft such a convention if, indeed, we wished to proceed in this direction at this time. We feel that discussion in the broader forum of the General Assembly, where political, legal, and economic aspects can be taken into account, is much more desirable, and we are not in favor of pushing forward in the IOC on this subject.

Mr. FRELINGHUYSEN. Is there any way of blunting the Soviet initiative singlehandedly, if the other members of this Intergovernmental Oceanographic Commission should feel it was a good idea?

Mr. POPPER. The Commission is about to meet. It meets next month.

What I have been referring to are our plans for that meeting. We will make our views known.

I have no knowledge of how the other members will feel but I should have thought they would be rather impressed by the broader responsibility of the General Assembly if it should be getting into that field.

I might add one word about the proposal of Malta. I doubt seriously that the General Assembly could get very far with a proposal of this order of specificity on such short notice. What I am saying is that I think there would have to be the beginning of a process of study through committees, through specialists, and that sort of thing, and I think it would be reasonable to expect that it would be a long time before any specific operational types of activity would come out of this process. The deliberative process in the United Nations tends to be lengthy in any event.

Mr. FRELINGHUYSEN. However, if there were sufficient appeal to the developing nations, which Malta's resolution seems to have, I would think you could have a setting aside of the normal course of deliberation and a quick adoption of something which we might feel was very premature, as you indicated today.

Is there any way in which action can be blocked if there is no accepted method by which action does come?

Mr. POPPER. Let me make a few points on that score. First of all, as you know so well, Assembly resolutions are recommendations and not definitive. In order for this country to be bound by any new legal arrangements with respect to the deep seas or anything else we would have to get the approval of the U.S. Government through treaty or through other appropriate action involving the Congress.

As to the possibility of a hasty action by the big majority of underdeveloped countries in the General Assembly, it is interesting to note that in the very short discussion which took place in the General Committee of the Assembly yesterday some countries expressed some slight reservations. Some countries are quite jealous of their sovereignty extending quite far into the ocean. I call to your mind the South American Pacific States, for example.

I suggest therefore that any country which has a seacoast, developed or underdeveloped, will want to think very carefully about what happens as you move into this new and largely unexplored area, so I

would be the last to make any definite predictions. My honest expectation would be that this is an area in which the United Nations will proceed slowly.

Mr. FRELINGHUYSEN. Assuming at some point there would be a desire to consider the specific terms of a convention or treaty, would this be referred to the International Law Commission? What is that?

Mr. POPPER. That is a standing body of legal experts. It is an agency of the United Nations. It has considered and prepared for action by the Assembly and for adoption a number of treaties—treaties on diplomatic and consular rights, studies on the law of treaties, very technical activities in which the knowledge and expertise of international lawyers are necessary. We have a representative on that Commission. At present he is Ambassador Richard D. Kearney, formerly Deputy Legal Adviser of the State Department. The Commission meets periodically through the year, because it has a standing agenda of work on treaties and international law.

Mr. FRELINGHUYSEN. One final question. You say on page 3 of your statement there is a need for additional guidance with respect to the floor of the sea. You refer also to the relative absence of international law in this respect. Is this need felt by the executive branch, or generally?

Mr. POPPER. I think it will be universally recognized that with the rapid development of technology this need arises.

As has been stated here, American industry would want to know what its rights, privileges, and obligations are. Certainly we have many nongovernmental organizations which are beginning to publish proposals. I thought Senator Church's report on his work was very interesting. I should like to point out, Mr. Chairman, that what was referred to earlier today was not any activity of the Senator during his tenure as a delegate to the General Assembly, but his own views expressed in a report to the Senate Foreign Relations Committee last year after the Assembly was over.

This sort of thing, as it bubbles up in this country and elsewhere, leads one to believe that there is a need for thorough study in this area which may well result, eventually, in some type of action not yet foreseen.

Mr. FRELINGHUYSEN. It was the word "guidance" that interested me—whether we needed guidance from the United Nations or you needed guidance from Congress, or who is guiding whom, or does it mean there is a need for full discussion of the implications from the point of view of national security and so on?

Mr. POPPER. And guidance for those who work in this environment. Guidance for industry, guidance for scientists, guidance for all of those who are interested in working in the deep seas in the future.

Mr. FRELINGHUYSEN. Thank you very much.

Mr. FASCELL. Mr. Gross.

Mr. GROSS. One quick question: Mr. Popper, you spoke of the concern of certain member nations of the United Nations—that is, coastal nations who may not be supporting this move.

Do you have any idea of the breakdown of the voting strength in the General Assembly as between coastal nations and landlocked nations?

Mr. POPPER. I would be interested in going through the list and discovering just how many of the United Nations members have coasts and how many do not. I will be glad to do that and supply it for the record.

Mr. FASCELL. Please supply that for the record, Mr. Popper.

(The following information was subsequently received by the subcommittee:)

DEPARTMENT OF STATE,
September 22, 1967.

HON. DANTE B. FASCELL,
House of Representatives, Washington, D.C.

DEAR CONGRESSMAN FASCELL: In accordance with your request during the course of my testimony this morning, I am enclosing for inclusion in the record a list of UN members that are coastal states. The number of coastal states is 99, including the Ukrainian S.S.R. Twenty-three members do not have coastlines. These are:

Afghanistan	Luxembourg
Austria	Malawi
Bolivia	Mali
Botswana	Mongolia
Burundi	Nepal
Byelorussian S.S.R.	Niger
Central African Republic	Paraguay
Chad	Rwanda
Czechoslovakia	Uganda
Hungary	Upper Volta
Laos	Zambia
Lesotho	

The question also arose whether Malta has adhered to the Convention on the Continental Shelf. I have checked with the Legal Adviser's office and I am informed that Malta has subscribed to that convention.

Sincerely yours,

DAVID H. POPPER,
Acting Assistant Secretary for International Organization Affairs.

COASTAL STATES MEMBERS OF UN

Albania	Guatemala	Norway
Algeria	Guinea	Pakistan
Argentina	Guyana	Panama
Australia	Haiti	Peru
Barbados	Honduras	Philippines
Belgium	Iceland	Poland
Brazil	India	Portugal
Bulgaria	Indonesia	Romania
Burma	Iran	Saudi Arabia
Cambodia	Iraq	Senegal
Cameroon	Ireland	Sierra Leone
Canada	Israel	Singapore
Ceylon	Italy	Somalia
Chile	Ivory Coast	South Africa
China	Jamaica	Soviet Union
Colombia	Japan	Spain
Congo—Brazzaville	Jordan	Sudan
Congo—Kinshasa	Kenya	Sweden
Costa Rica	Kuwait	Syria
Cuba	Lebanon	Tanzania
Cyprus	Liberia	Thailand
Dahomey	Libya	Togo
Denmark	Madagascar	Trinidad and Tobago
Dominican Republic	Malaysia	Tunisia
Ecuador	Maldives Islands	Turkey
El Salvador	Malta	Ukrainian S.S.R.
Ethiopia	Mauritania	United Arab Republic
Finland	Mexico	United Kingdom
France	Morocco	United States
Gabon	Netherlands	Uruguay
Gambia	New Zealand	Venezuela
Ghana	Nicaragua	Yemen
Greece	Nigeria	Yugoslavia

Mr. GROSS. We don't want this thing to slip up on us, Mr. Popper. In my opinion, for whatever it is worth, this Congress would speedily adopt one of these House Joint Resolutions, if it was indicated you were going to proceed in the United Nations.

Mr. FRELINGHUYSEN. Didn't Mr. Hanna, Mr. Chairman, indicate there were something like 102 countries that had coastal waters?

Mr. POPPER. I didn't hear him say that, Congressman. He was speaking of 132 nations and so on and I may have missed it.

Mr. FRELINGHUYSEN. He called them "seaboard nations" according to my notes.

Mr. FASCELL. Your seeking out that information for us would be very helpful. We would like to be kept aware of any substantive matters. I am sure our communications have been good and will continue to be good. Of course, nobody wants to be presented with an accomplished fact and this is a matter of great importance.

How about taking me over the hurdles of politics here just a bit? Malta was not a signatory to the 1958 convention.

Mr. POPPER. No, sir, Malta was not independent at that time.

Mr. FASCELL. But they could by protocol become part of the convention as a signatory; is that correct?

Mr. POPPER. They could adhere; yes, sir.

Mr. FASCELL. But they haven't chosen to do that yet?

Mr. POPPER. I would like to check that out, just to be sure.

(Subsequently Mr. Popper informed the subcommittee that Malta acceded to the Convention on the Continental Shelf by notification, dated May 19, 1966, to the Secretary General of the United Nations in which Malta stated that she considered herself to be bound by the various conventions on the law of the sea to which the United Kingdom had subscribed prior to Malta's independence on September 21, 1964.)

Mr. FASCELL. Malta is on an extensive continental shelf, is it not, and is an independent nation?

Mr. POPPER. I am not acquainted with the situation.

Mr. FASCELL. It is not on an extensive shelf?

STATEMENT OF BURDICK H. BRITTIN, DEPUTY SPECIAL ASSISTANT FOR FISHERIES AND WILDLIFE TO THE SECRETARY OF STATE

Mr. BRITTIN. To the east it has a fairly good sized shelf but to the west and south not very extensive.

Mr. FASCELL. So it does not have a very extensive shelf?

Mr. BRITTIN. In the Mediterranean to the east of Malta she has a fairly good shelf.

Mr. FASCELL. That is toward the sea?

Mr. BRITTIN. The treaty governs the Mediterranean because the Mediterranean is considered to be the high seas.

Mr. FASCELL. To the east it has a continental shelf and to the west it has none?

Mr. BRITTIN. Comparatively little.

Mr. FASCELL. So Malta may not have any special reason to get really excited about becoming protocol to the existing convention?

Mr. POPPER. To the extent they have a shelf, Mr. Chairman, they might have an interest.

Mr. FASCELL. Their interests may lie the other way. There is nothing wrong with that, of course.

Mr. POPPER, there has been some discussion here this morning that sovereignty to the deep seabeds would be turned over to the United Nations under the Maltese proposal, but I haven't found that anywhere in Malta's proposal or their memorandum of explanation. From what does that concept stem?

Mr. POPPER. When you refer to the memorandum, are you referring—

Mr. FASCELL. "The inclusion of a supplementary item in the agenda of the 22d session by Malta with the attached memoranda of explanation."

Mr. POPPER. You won't find those exact words, but if you look at point 4 of the explanatory memorandum, the last paragraph states:

It is believed that the proposed treaty should envisage the creation of an international agency (a) to assume jurisdiction as a trustee for all countries over the sea-bed and the ocean floor.

Since this appears to shade into the concept of sovereignty, I assume that it is what was referred to in the colloquy that took place here earlier this morning.

Mr. FASCELL. That is an assumption. It is an inference and it is an interpretation by people who have testified and who read the Maltese memorandum, but the memorandum doesn't say that.

Mr. POPPER. Before we conclude this part of the discussion, I would point to paragraph 3(a) which says:

The sea-bed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation in any manner whatsoever.

Mr. FASCELL. That is a proposal to be included in the treaty.

Mr. POPPER. That is quite correct.

Mr. FASCELL. So there might be some assumptions, if one wanted to be legalistic about the use of that language, because it presupposes the existence of the right to national appropriation.

Mr. POPPER. And denies it.

Mr. FASCELL. Turns around and denies it, but nevertheless, having said that, all it is is a Maltese proposal on a principle that it feels ought to be incorporated in the treaty.

Mr. POPPER. Yes, sir.

Mr. FASCELL. So we still haven't found anything anywhere that says there is a proposal pending which would transfer title to or sovereignty over the seabeds to the United Nations. Is that correct?

Mr. POPPER. Those words do not appear in this proposal.

Mr. FASCELL. Does such a proposal exist anywhere so far as you know?

Mr. POPPER. No, sir.

Mr. FASCELL. Now, in paragraph 4 of this memorandum it is stated, "It is believed that the proposed treaty should envision the creation of an international agency."

Obviously the words are self-explanatory. They can't be talking about the United Nations. You have to be talking about another international agency that doesn't exist right now, is that right?

Mr. POPPER. Absolutely.

Mr. FASCELL. If that is true, as I understand your response to Congressman Frelinghuysen, the probabilities are that if this item got on the General Assembly's agenda and was subsequently approved, the International Law Commission would set about working up a draft of such a treaty. The next step would be for the International Law Commission to get experts together and work out a draft. Is that correct?

Mr. POPPER. With this modification, Mr. Chairman, that the International Law Commission might not be the chosen instrument. It might be something like the Outer Space Committee, which was a little different format. But some group of experts.

Mr. FASCELL. And once the substance of the document had been preliminarily agreed to, it then would be submitted to all nations for determination as to whether they wanted to become signatories. Is that correct?

In other words, the United Nations by action of the General Assembly cannot either formulate the treaty or put it into effect, is that correct?

Mr. POPPER. If I understand you correctly, Mr. Chairman——

Mr. FASCELL. The General Assembly, by vote, can't put a treaty into operation.

Mr. POPPER. You are quite correct.

Mr. FASCELL. So the inferences that I have heard and I have read—the fears and the concerns about the U.N. taking over jurisdiction of the deep seabeds by resolution—are inaccurate because the U.N. can't do that. It doesn't have that power.

Mr. POPPER. It does not have that power.

Mr. FASCELL. The only way it could be done is by a treaty to which all of the nations would have to affix their signatures; they would have to agree to the terms of it. They would have to voluntarily give up whatever sovereignty they presently possess in this area, if any. Isn't that correct?

Mr. POPPER. That is quite correct.

May I make one supplementary comment, which is that I think you have put your finger, Mr. Chairman, on the essential point here as regards legal obligations and commitments of members. I would point out that there might be an intermediate stage before anyone approached the idea of a treaty. One might talk about principles before one talks about treaties, or guidelines or something like that. These would have the same effect as all other General Assembly resolutions.

Mr. FASCELL. It would be a sense of the United Nations resolution, just like a sense of the Congress resolution.

Mr. POPPER. Yes.

Mr. FASCELL. A country might consider itself to be bound by it or it may not. The ultimate decision would be made at the time when a given country would indicate whether it wanted to become a signatory to a treaty.

Mr. POPPER. Yes, sir.

Mr. FASCELL. I just wanted to make certain on the record that I had understood this matter properly. The United Nations either by action of the General Assembly or by action of any other organ, body, commission, group, or committee could, by vote, majority or otherwise, arrogate unto itself the sovereignty, the title, the use, the juris-

diction, of the deep seabed, the ocean or any part thereof, including either above, under, or around. Is that correct?

Mr. POPPER. Yes, sir, that is correct. They could not legally bind this country without its consent.

Mr. GROSS. Mr. Chairman, if I may ask a question, what is the memorandum? Where was this prepared and what does it represent? Who prepared this?

Mr. POPPER. Mr. Chairman, I think you have there a copy, not on the original paper, of the proposal made by the representative of Malta.

Now, the normal procedure when a delegate wants to put an item on the agenda is to submit a title, which he has done here, a declaration and treaty and so on, and an explanatory memorandum. That has evidently been copied on the letterhead of the Committee on Foreign Affairs, but the original is a U.N. document.

Mr. GROSS. May I assume that this is a true copy of the memorandum?

Mr. FASCELL. I think you can, Mr. Gross. It was made by our staff.

Mr. GROSS. I thought that is what we were dealing with, the memorandum submitted by the Maltese delegation to the United Nations, but I wanted to be doubly sure of it.

Item 3, "It is therefore considered the time has come to declare the seabed and the ocean floor a common heritage of mankind and immediate steps should be taken to draft a treaty embodying" and so on and so forth.

Well, I can agree with the chairman that this is not saying that the United Nations is going to draft the treaty or that the organization or agency, whatever it may be, will be completely under the jurisdiction of the United Nations, but this is where it begins, and I would be surprised and I think the chairman would be surprised if this was not kept within the jurisdiction of the United Nations in some form or another. It would be an offspring of the United Nations.

Does the Chairman agree?

Mr. FASCELL. Not necessarily.

Mr. POPPER. The language is quite open-ended. It says neither yes nor no.

Mr. GROSS. You can bet your life it is open-ended, and apparently for a purpose.

Mr. FASCELL. The treaty would have to prescribe, would it not, if one were going to be written, that the organization created under the treaty would be part of the United Nations? Otherwise it could very well be an independent international organization. Unless a convention or a treaty itself would provide for the establishment of an agency specifically affiliated with the United Nations, it wouldn't be. It couldn't be. It cannot be properly inferred that a group of signatory nations to a convention automatically are under the U.N.

They are automatically out from under the U.N., as a matter of fact, by virtue of the fact that they sign a separate convention, unless the agreement specifically provides a relationship with the U.N.

Mr. POPPER. I would expect that any treaty written and concluded would contain within it some statement of what the relationship to the United Nations would be. How close, how distant, one can't say at this time.

Mr. FASCELL. One could go by history though, could one not? The convention of the coastal states is certainly no part of the United Nations family.

Mr. POPPER. It stands independently.

Mr. FASCELL. If it weren't for that fact, you may not even have a Maltese proposal.

Mr. GROSS. It seems to me, Mr. Chairman, that we can just as logically assume that this agency or this organization, whatever it is—reading paragraph 4, “proposed treaty should envisage the creation of an international agency * * *” we can just as logically assume here today that this will be a United Nations organization. We can just as logically assume it will be that as any other organization.

Mr. FASCELL. Of course. There is no argument there at all.

The request has now been presented by the Government of Malta to the Secretary General with the explanatory note. What happens next?

Mr. POPPER. Yesterday afternoon the General Committee, or Steering Committee of the Assembly decided to admit this item to the agenda, the item being the title which you see at the top of the piece of paper. They did not reach the stage of allocating it to a specific committee of the General Assembly. They should reach that stage today. It is theoretically possible to argue that this could be assigned to the Legal Committee of the General Assembly or the Economic Committee of the General Assembly or the Political Committee of the General Assembly.

Mr. FASCELL. Or all of them.

Mr. POPPER. Or all of them, and I am not sure what the decision would be.

It will be a matter of great importance in political circles, whatever we do.

Mr. FASCELL. The item is now on the agenda and the next thing is reference to a committee; then what?

Mr. POPPER. The committee sets up the order of items on its own agenda. When it reaches this subject, we should then have some specific proposal by the representative of Malta and by others who may have proposals to make on this subject.

It is not necessarily the case that the memorandum we see here would be precisely what the representative of Malta would put into the committee as the draft resolution he wanted the Assembly to consider.

Mr. FASCELL. Nor can we expect that would be the precise proposal that would come out of the committee.

Mr. POPPER. Indeed not. As Ambassador Goldberg said yesterday, we shall have specific proposals to make; others will no doubt have proposals to make; and it will only be after a discussion of all those proposals that the committee finally comes around to a text which I hope it will adopt and report out to the plenary session of the Assembly.

Mr. FASCELL. It might be that Malta would have to vote against its original proposal since it couldn't recognize it in its final form?

Mr. POPPER. It is theoretically possible.

Mr. FASCELL. What is the time schedule on this thing? Do you have any idea as far as committee action is concerned? What has your experience been?

Mr. POPPER. The committees will start to meet near the end of the general debate. They will begin to meet in 2 or 3 weeks.

Mr. FASCELL. What month does that put us in?

Mr. POPPER. That puts you into mid-October. I would be rather surprised if this were the first item on the agenda, especially if it goes to the Political Committee. There are other things—Nonproliferation, Korea, the Middle East.

Mr. FASCELL. There will be speeches for hometown consumption first.

Mr. POPPER. To be very general about this, I would say that November is probably the first month in which you would begin to get detailed consideration. I may be wrong, but I don't think so.

Mr. FASCELL. The reason I say that is, if the United States is going to have a specific proposal, the subcommittee would like to know what that is.

Mr. POPPER. Yes. I am just pointing out that the action taken could be procedural and general. We don't feel it is the time now to close options.

Mr. GROSS. I find it interesting, Mr. Popper, that Switzerland signed the convention dealing with the continental shelf. I don't know whether you care to comment on that.

Mr. POPPER. That was one of, I think, for conventions that were worked out with great pain and agony at the 1958 conference in Geneva, where I was present. I was part of the U.S. delegation. There was a convention that dealt with the rights of landlocked states, too, so they had an interest, not in one convention, but in all, in a sense, because, as you know, they have a merchant marine and some interest in the oceans.

Mr. GROSS. Switzerland wanted to join in the agony, is that right?

Mr. POPPER. In their own interest.

Mr. FASCELL. Thank you, Mr. Popper. We appreciate the time that you have given us, your advice and your statement.

We have some additional statements for the record—one by our colleague, the Honorable Alton Lennon of North Carolina; and others by the Honorable Thomas N. Downing, Honorable Edward Garmatz; Honorable Jack Edwards, Honorable Thomas M. Pelly and the Honorable Don Fuqua. We also have letters directed to me from the National Oceanograph Association, and the Chamber of Commerce of the United States which will be placed in the record at this point.

(The statements referred to follow:)

STATEMENT OF HON. ALTON LENNON, A REPRESENTATIVE IN CONGRESS FROM
THE STATE OF NORTH CAROLINA

Mr. Chairman and Members of the Committee, I appreciate the opportunity to make a statement concerning H.J. Res. 822, the Resolution I introduced, and related measures.

As Chairman of the Subcommittee on Oceanography, I am vitally interested in all matters pertaining to the study and exploitation of the seas and the seabed. That interest is shared by all members of the Subcommittee.

Interest in oceanography and development of the resources of the marine environment has grown with the implementation of P.L. 89-454, which provided for the establishment of the National Council on Marine Resources and Engineering Development and the Presidential Commission on Marine Science Engineering and Resources. These bodies are studying and reviewing all significant marine science activities to recommend a "national oceanographic program that

will meet the present and future national needs." The Council and Commission are also studying the international aspects of developing the ocean resources in cooperation with other nations. Their respective reports will be available in about 15 months.

Other marine environment studies of an international nature are being conducted. In March, 1966, the U.N. Economic and Social Council adopted a United States resolution which requested the Secretary General to conduct a survey of the present state of knowledge of marine resources beyond the continental shelves and the techniques for their exploitation. In December, 1966, the United Nations General Assembly adopted a resolution requesting the Secretary General to make a comprehensive survey of marine science and technology activities. Reports of these surveys are expected in the spring of 1968.

The National Council has contracted for five studies with respect to the legal aspects of development and management of marine resources. These studies relate to:

1. The legal problems involved in the development, recovery, and control of off-shore mineral resources. (Columbia University Law School)
2. The legal problems involved in the use of the living resources of the marine environment. (Columbia University Law School)
3. Domestic legal problems involving marine resources along the coast of the United States and its territories, including the identification, classification, and analysis of significant federal, state, and local statutes, regulations, and precedents. (New York University Law School)
4. Liability aspects of activities in the marine environment. (American Trial Lawyers Association)
5. International legal problems in the scientific exploration and investigation of marine environment, including the use of marine objects and structures for such purposes. (Ohio State University)

Even the Soviet Union has proposed the creation of a legal group to report on norms of exploitation of mineral resources from the floor of the high seas. The proposal has been circulated, and Intergovernmental Oceanographic Commission members will make comments at their Paris session next month.

Other studies are being conducted on the best solution for controlling the exploitation of mineral resources from the continental shelves. I believe it is in our national interest to wait for these studies to be completed as keenest minds available in international law and marine science study all aspects of this complex problem in the hope that an equitable solution can be resolved for all nations.

It is interesting to note that the Department of Interior has already prepared maps for leasing purposes off the continental shelf. In FY 66, 928 mineral leases off California, Louisiana, Oregon, Texas, and Washington covered over 4 million acres with royalties of \$248,317,216 accruing to the U.S. Treasury. In June of this year, an oil company bid \$512 million for a lease off the Louisiana shore. This bid probably resulted from the tie-up of oil in the Near East about this time and is proof of our need for minerals in the seabed. There can be no doubt but that our Country would suffer irreparable harm if jurisdiction to the seabeds were transferred to any organization. We must remember, too, the seabed contains many other minerals that our Country needs now and will need in the future. Mining operations are just beginning and even now are of significant magnitude.

About a week ago, I requested the Executive Secretary of the National Marine Resources Council, Dr. Edward Wenk, Jr., to amplify his remarks before the Oceanography Subcommittee on this issue. I was particularly interested in the Administration's position on the Malta proposal. Dr. Wenk responded by letter to me on September 19, and I think it most appropriate that his letter be made a part of the record of this hearing.

STATEMENT OF HON. THOMAS N. DOWNING, A REPRESENTATIVE IN CONGRESS
FROM THE STATE OF VIRGINIA, CONCERNING HOUSE JOINT RESOLUTION 818

MR. CHAIRMAN: I thank you for allowing me the opportunity of placing my remarks in the Record incident to your Subcommittee hearing on H.J. Res 818 and related measures in opposition to vesting title to the ocean floor in the United Nations. As one of the authors of the Resolution opposing such action, I am deeply concerned over any proposal of this sort.

In my judgment, any such action as contemplated by the government of Malta is premature. We have only a limited understanding of the extent of the undersea resources, the means of obtaining access to them, the conditions for processing

and marketing them, and the impact which activities connected with their extraction and mining will have on the other uses of the sea. Until such time as a comprehensive study has been concluded any action to vest control of deep ocean resources in an international body would be ill advised and untimely.

The exploration of inner space has just now begun but we do know that the oceans could provide a bonanza of mineral resources and food if properly explored and exploited. Due to the worldwide population expansion, the supply of food in the next century is a problem of the deepest concern. It is believed that the ocean can and will provide sufficient nutrients for any world population.

I believe strongly that if title to the oceans' bottoms is placed under the control of the United Nations or any international agency our progress in oceanography will be severely impeded. Free oceans permit free competition which in turn will allow all nations and any nation to proceed rapidly in uncovering the bountiful gifts which we know they hold.

I commend the Subcommittee on International Organizations and Movements for its promptness in undertaking these hearings.

STATEMENT OF HON. EDWARD A. GARMATZ, CHAIRMAN, HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES, CONCERNING HOUSE JOINT RESOLUTION 819

Mr. Chairman and members of the Committee, I greatly appreciate your letter of September 15 inviting me to testify during today's hearing, which you have scheduled to take testimony on my bill, H.J. Res. 819, and related measures, in opposition to vesting control of the resources of the bed of the deep ocean beyond the Continental Shelf in the United Nations.

I think the introductory recitals to H.J. Res. 819 and the other similar and identical bills are fully explanatory. They point out:

(1) Our awareness of the fact that there are certain groups and individuals favoring hasty action for the purpose of placing the United Nations in control of the resources of the bed of the deep ocean and the sea floor beyond National jurisdictions;

(2) The fact that our National goals for the development of deep ocean resources have not yet been clearly defined, nor have we formulated an approach to the development of these resources;

(3) The fact of our limited understanding of the extent of the resources and other aspects dealing with the means of obtaining access to them, processing and marketing them, and the interrelation between the exploitation of such resources and other uses of the sea;

(4) That it is National law, in the form of Public Law 89-454, the Marine Resources and Engineering Development Act of 1966, which established machinery in the form of the National Council on Marine Resources and Engineering Development and the Commission on Marine Science, Engineering and Resources, for the particular purpose of identifying National objectives concerning undersea resources and recommending programs to accomplish these objectives; and

(5) Responsible National organizations and individuals interested and experienced in the development of undersea resources oppose suggestions concerning the vesting of control in such resources in the United Nations at this time.

Mr. Chairman, specifically, there has been brought to my attention the so-called "Malta Proposal", by which the government of Malta has requested the Secretary General of the United Nations for the inclusion of a supplementary item in the agenda of the 22nd Session of the United Nations, which convened earlier this week, concerning the "reservation exclusively for peaceful purposes of the sea bed and of the ocean floor, underlying the seas beyond the limitation of our National jurisdiction, and the use of their resources in the interests of mankind."

Superficially, it would seem difficult to quarrel with such a high-sounding purpose. But the fact is, despite extensive efforts in recent years to gain an understanding of all aspects of the oceanic environment, we are still only at the threshold of knowledge. I personally think, and I know my views are shared by many, many others familiar with the subject, that it would be most unwise, and dangerous to the vital interests of the United States, and even of the world, to seriously consider such a proposal at this time, when there is such vast lack of knowledge concerning such an important subject.

The Marine Resources and Engineering Development Act of 1966, which I mentioned a moment ago, was enacted after seven years of comprehensive study by the Congress in recognition of the extensive work that needed to be done in all of the fields of which is generally referred to as "oceanography". Recognition was given to the very problem which is the subject before you today.

In section 4 (a)(5), the Marine Resources Act, among other things, imposes a duty upon the President, with the advice and assistance of the Marine Resources Council, to "undertake a comprehensive study * * * of the legal problems arising out of the management, use, development, recovery, and control, of the resources of the marine environment."

Until this is done, we can have no possible way of knowing what we are dealing with in connection with a proposal such as that submitted to the United Nations by the government of Malta.

Hearings which are presently being held by our Subcommittee on oceanography are providing insight into the great strides we have been making in recent years toward understanding of the environment of the world oceans. But while reflecting great strides, these hearings are also emphasizing how little we presently know and how much more we must learn, if we are to understand the scope and significance of the resources of the oceans.

Five-sevenths of the world's surface is covered by oceans, and the sea beds beneath them contain untold wealth and resources which have yet to be discovered, understood and exploited. We must not endanger or impair our future access to these resources by a decision made in a moment of haste.

In the light of the foregoing, I urge your approval and support of the sentiments expressed in my bill, H.J. Res. 819, and the other resolutions before you so that it will become effectively and fully clear that the United States is at this time unalterably opposed to any action that would vest control of deep ocean resources in any international body.

Thank you very much for the opportunity to appear before you today.

STATEMENT BY HON. JACK EDWARDS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ALABAMA, IN SUPPORT OF H.J. RES. 816

The government of Malta has proposed in the United Nations General Assembly an item providing in effect that jurisdiction and control of the seabed and the ocean floor be given over to the U.N. The item secondly provides that net financial benefit derived from exploitation of the ocean floor be used in the development of the newly-developing countries.

At first glance this idea might seem to be sensible. But there are at least three major questions to be asked.

First, are we, as one of the major scientific nations of the world, prepared to renounce all claim to national benefits from the ocean floor before anyone knows the actual extent of the resources existing there? If there are those among us who believe that we should do this, then surely their case has not been made evident. It is my feeling that if we were to make this kind of commitment, it would be an act of gigantic folly.

Second, is the United Nations prepared to undertake this kind of responsibility? Many of us will answer in the negative. In my opinion, the United Nations has not demonstrated, especially during these past several months, the kind of stability, responsibility, and effectiveness in dealing with international affairs that appears to justify the placement of the proposed oceanography role on its shoulders.

Third, if the world's oceanography is to be turned over to the United Nations, then who is actually to do the research and exploration? Are individual nations to be expected to continue their separate oceanography programs only to turn over all the results to the U.N.? Or, would this move require that every nation bring a total stop to its oceanography plans, with the U.N. then proceeding to set up its own research and exploration projects?

It is apparent that the Malta proposal requires a most careful and thoughtful inspection. I am gratified, and I know many of my fellow members of the Merchant Marine and Fisheries Committee are also gratified, to know that the Department of State does not support the Malta proposal.

I believe it is important that the Congress make its voice heard in opposition to the Malta proposal and I urge the Foreign Affairs Committee to take a strong stand in this regard.

STATEMENT OF REPRESENTATIVE THOMAS M. PELLY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mr. Chairman, I am pleased to state my views on the proposed Malta Resolution to your committee.

I consider this a matter of grave concern, Mr. Chairman, for to even consider giving up sovereignty of the ocean floor would be ill-advised.

I completely disagree with the Malta Resolution's position that, "The sea-bed and the ocean floor, underlying the seas beyond the limits of present national jurisdiction, are not subject to national appropriation in any manner whatsoever." Mr. Chairman, under Article I of the 1958 Geneva Convention, sovereignty already has been given to coastal nations over natural resources adjacent to each state. The Geneva Convention concluded, and it was ratified by members of the United Nations, that sovereignty extends to a depth of 200 meters off a coastline, and also beyond that limit to where the depth of deeper water admits the exploitation of natural resources. Mr. Chairman, we already have sovereignty over submarine areas adjacent to our coast.

I have been assured that there are no secret agreements to transfer control over all sea-bed, ocean resources to the United Nations; however, I strongly take the position that international conventions already have granted ownership of the vast mineral riches under the sea to coastal states, including the United States. I believe any attempt to give these rights away should be halted.

Therefore, I strongly urge, Mr. Chairman, that the Committee on Foreign Affairs report favorably a Resolution such as House Joint Resolution 828, which I introduced, to express Congressional opposition to vesting title to the ocean floor in the United Nations.

Thank you for this opportunity to present my views on this important matter.

STATEMENT BY HON. DON FUQUA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA, IN SUPPORT OF H.J. RES. 837

Mr. Chairman, being given the opportunity to express my opposition to vesting title to the ocean floor in the United Nations is very much appreciated. I have presented a resolution, H.J. Res. 837, which would express the sense of the Congress that the seas not be placed under the jurisdiction of the United Nations as has been suggested by the tiny island of Malta.

The vast wealth of the seas cannot be estimated by twentieth century technology. Yet, we know that the potential is vast.

The United States has lately given more attention to the exploration of the seas, for it has been said that we know more about outer space than we do about the seas of our own planet.

Should we agree to the proposal under consideration, we would be throwing away the vast sums of money we have invested and will invest to harvest the bounty of the seas. It would be an outright take over by an unstable organization of most of the resources of this earth.

I certainly advocate peaceful exploration of the oceans and for international cooperation, but I see nothing to be gained by giving away all rights to ownership to the United Nations.

The day will come when we will need additional international rules and regulations. I understand and support that concept.

What I oppose is giving away ownership to the United Nations. We would thus be giving up rights and privileges of American citizens now and in the future.

It is my privilege to represent the congressional district of Florida in which is located the Florida State University at Tallahassee. This is an institution which has taken the lead in oceanography research. Florida, with its great coastline, has a vital interest in a proposal such as this, and I submit that the resources of the seas are priceless. At one time, it was believed that Alaska was a worthless area of land. It was thought by many that the Louisiana purchase was sheer folly.

Giving away our rights to the ocean floors would be foolish and shortsighted for this Nation.

STATEMENT OF HON. GEORGE V. HANSEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF IDAHO

Mr. Chairman and members of the Committee, I appreciate the opportunity of presenting this statement in support of H.J. Res. 816 and similar and identical measures opposing the so-called Malta Proposal to turn over to the United Nations

sovereignty (or, if you will, control) over the resources of the sea bed beyond the Continental Shelf.

I know there are those within this Administration and within the Congress who favor such a proposal. I also know there are a few in the private sector of our economy who favor it.

But I believe there are far more in the Congress and in the private sector who favor a "go-slow" approach regarding the disposition of these under-sea resources, and I am among them.

There is far too much at stake, Mr. Chairman, for hasty action to be allowed or even contemplated. And there is far too little known as to the effect such a move would have on our future economy and, indeed, on the economies of the other nations of the world.

The sea has always been one of the great mysteries of the world and conjecture as to the treasures it might hold has always challenged the imagination of man. And, after centuries of speculation, man is just now beginning to probe the depths of the sea in his quest for concrete knowledge of what lies beneath well over half of the world's surface.

This thrust was given impetus just last year by passage of the Marine Resources and Engineering Development Act of 1966 to study undersea resources. To negate these studies now by turning over to the United Nations control over the sea's wealth is, to say the least, premature.

Other implications of this proposed surrender are more far-reaching, affecting the very sovereignty of the United States. They speak in terms of the continental shelf, and of giving to the UN control over the sea bottoms beyond it. But where does the continental shelf end? Does it not, at points, come within a mile or two of our coast line? Would, then, the United Nations assume jurisdiction at those points? How would it be administered? Who would administer it? This is a field in which great expertise is needed. Does the United Nations, of itself, have that expertise? If not, where would it get it?

There are too many troublesome questions to be answered, Mr. Chairman, before we should consider—if we should ever consider—divesting ourselves of the opportunity and means of enhancing our own economic welfare and allowing other peoples the same privilege.

However, apart from that, the United Nations has shown itself all too frequently in the past of being utterly incapable of handling problems of far lesser scope to be allowed to assume complete control over a matter which may ultimately prove to be of more importance than the conquest of space.

I am unalterably opposed, Mr. Chairman, to the Malta and similar proposals. I urge passage of H.J. Res. 816 or one of its companion bills.

I thank you for the opportunity of presenting this statement on a subject on which I feel very strongly.

NATIONAL OCEANOGRAPHY ASSOCIATION,
Washington, D.C., September 22, 1967.

Hon. DANTE B. FASCELL,
Chairman, House Subcommittee on International Organizations and Movements,
Rayburn House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: The National Oceanography Association is pleased that the Subcommittee on International Organizations and Movements is now holding hearings on H.J.R. 820, introduced by Congressman Richard T. Hanna, and similar resolutions which oppose giving the U.N. control of deep-sea resources at this time.

NOA sincerely hopes that you and your committee will act favorably on these resolutions and will recommend adoption.

NOA first publicly opposed a suggestion for U.N. control of deep-sea resources last May. At that time we issued a statement pointing out that "the granting of lease rights to the deep ocean mineral resources presents varied and complex problems which the United Nations was not created to manage." The statement also said that "giving the U.N. an independent source of income and international police powers, as implied in the suggestion, raises issues warranting the most serious consideration of the United States Congress."

As the result of certain recent pressures to internationalize the deep-sea resources immediately, NOA again publicly opposed U.N. control on September 13, 1967. On that date we stated that "conferring title to mineral resources on the deep ocean floor on the United Nations or any other group at this time would be premature and ill-advised."

Among the reasons for NOA's position are these:

(1) *Our knowledge of the extent of the deep-sea resources is as yet limited.*—This is true of the means of gaining access to these resources as well as of the conditions for processing and marketing them. We do not know, either, at this point, how activities connected with the extraction of those minerals will affect other uses of the sea.

(2) *The United States has not yet developed national goals for ocean activities.*—The National Council for Marine Resources and Engineering Development and the President's Commission for Marine Science, Engineering and Resources are currently attempting to identify and recommend such goals. Their report will be ready, at the earliest, late in 1968.

(3) *Retardation of technological progress.*—At this moment, oceanographic technology is advancing rapidly. For example, we now have the capability to recover oil from the sea bed at a depth of at least 200 meters, and soon we will be able to go beyond that depth. But to go beyond 200 meters, a company would have to ask U.N. permission if that body controlled the resources. U.N. machinery would hamper and delay technological progress.

In summation, lack of complete knowledge of existing resources, lack of national goals and discouragement of initiative due to uncertainties about U.N. procedures, argue against any hasty move toward international control of deep sea resources. Furthermore, to press for internationalization *now* as if it were the only solution, is to ignore developments such as those in the North Sea. For example, countries bordered by the North Sea have shown considerable maturity in their ocean-connected dealings with each other.

As signatories to the North Sea Treaty, they agreed that each has free access to a certain ocean area off its coast. Through the mechanism of the Treaty, they have created a middle-of-the-sea area, in which each of them may explore the ocean through a licensing agreement.

If countries in this and other areas of the world can make such agreements, there is time to give a great deal more thought to the future disposition of the deep sea resources. No hurried decision to internationalize them need thus be made.

NOA realizes that some competent authorities believe that in the long run a general agreement on the allocation of deep sea mineral resources may be necessary. But first we ought to have more evidence that the U.N. has the capability to take on such a vast and complicated task.

If NOA can be of any assistance in providing additional information, we hope you will let us hear from you.

Cordially,

C. B. HAMM, *Executive Director.*

CHAMBER OF COMMERCE OF THE UNITED STATES,
Washington, D.C., September 21, 1967.

HON. DANTE B. FASCELL,
Chairman, Subcommittee on International Organizations and Movements, House Committee on Foreign Affairs, House of Representatives, Washington, D.C.

DEAR MR. FASCELL: On September 22nd, your Subcommittee will hold hearings on House Joint Resolution 820, and other similar resolutions. These resolutions have been introduced to oppose the United Nations' Malta Resolution, which would give the United Nations "jurisdiction and control" over marine resources. The National Chamber applauds the quick attention given to this issue by your Subcommittee.

In a September 14th letter to Secretary of State Dean Rusk, Allan Shivers, President of the National Chamber of Commerce, expressed the Chamber's concern over this issue and urged that the United States delegation oppose the Malta Resolution. The arguments presented by President Shivers in his letter clearly indicate that restraint is needed on any action that would confer title to some of this nation's resources upon an international body.

In accordance with this position, the National Chamber supports House Joint Resolution 820, and similar resolutions. I would ask that this letter and the enclosed copy of the letter from President Shivers both be included in the record.

Sincerely,

DON A. GOODALL,
General Manager, Legislative Action.

Enclosure.

CHAMBER OF COMMERCE OF THE UNITED STATES,
Washington, D.C., September 14, 1967.

Hon. DEAN RUSK,
*Secretary of State,
 Department of State, Washington, D.C.*

MY DEAR MR. SECRETARY:

The Geneva World Peace Through Law Conference, on July 13, 1967, recommended that the United Nations proclaim that the nonfishery resources of the high seas, outside the territorial waters of any State, and the bed of the sea beyond the continental shelf, be subject to the jurisdiction and control of the United Nations. Recent reports indicate that the United States Department of State is encouraging General Assembly consideration of this resolution in late September. We are told that the United States delegation will support the resolution.

The National Chamber strongly urges the United States delegation to oppose this resolution because it is ill-timed.

At the present time no practical purpose would be served by the United Nations' resolution. This is not the time for considering United Nations' takeover of marine resources. We are at least five, possibly ten, years away from attaining the knowledge and technology essential to develop and begin to harness the resources of the sea. We cannot now predict the international situation that will exist at the time this knowledge is gained. Until the whole issue is analyzed intensively on a national basis, it would be premature to confer title upon the United Nations or any other group.

Proponents of the resolution argue that giving the United Nations the "jurisdiction and control" over marine resources would avert a possible major international issue—submarine colonialism—and that management of marine resources would supply the United Nations with an independent source of income.

I doubt that these arguments will ever be valid, and certainly there is nothing to substantiate them at the present time.

The submarine colonialism issue has been minimized by recent actions which express the desire of individual nations to settle, among themselves, differences regarding the high seas. Examples of this attitude include the North Sea Agreement, the Bering Strait Agreement, and the numerous international fishing agreements.

Further, since the development and exploitation of marine resources is years away, so is the use of these as a source of income for the United Nations.

The Geneva Convention on the Continental Shelf (1958), to which the United States is a party, clearly establishes that the rights to marine resources rest with individual nations. This Convention, in Article I, defines the "continental shelf." If there is reason to change this definition, as the proposed United Nations' resolution would do, it would seem that the way to make the change is to amend the Convention rather than to go outside the signatories and make the change through the General Assembly of the United Nations.

In effect, by changing the 1958 Convention's definition of the "continental shelf," the United Nations' proposal could make the entire Convention void. This is because the Convention does not include a protective clause that permits the changing of any article without voiding all the other parts of the Convention. Therefore, the United Nations' resolution is indeed a serious step that could completely abrogate an important international convention regarding the seas.

Still another reason to oppose the United Nations' proposal at this time is the Marine Resources Council and Commission. This group has been instructed to prepare a report which will include United States policy with respect to marine resources. The Commission has been assigned the task of formulating national policy on this important subject. Certainly, the United States should want to obtain and evaluate the report of this Commission before supporting any United Nations' resolution.

There is little to be gained by action now, and much to lose—the resources of the ocean. The National Chamber urges restraint on any action that would confer title to some of this nation's resources upon an international body. Such action should be deferred until sufficient knowledge exists upon which to base a decision, and until the need for such a decision is evident.

Sincerely,

ALLAN SHIVERS, *President.*

Mr. FASCELL. We will hold the record open for such other statements that may come to the subcommittee and we will adjourn this hearing subject to the call of the Chair. I want to thank you very much for your appearance and co-operation.

(The following was subsequently received for inclusion in the record:)

THE AMERICAN LEGION,
Washington, D.C., October 10, 1967.

HON. DANTE B. FASCELL,
Chairman, Subcommittee on International Organizations and Movements,
House Committee on Foreign Affairs,
Washington, D.C.

DEAR CHAIRMAN FASCELL: We have noted with interest that your Subcommittee is conducting hearings on H.J. Res. 816, and related bills, which oppose vesting title to the ocean floor in the United Nations. The American Legion is on record in opposition to providing the United Nations with any potential source of independent revenue, including the resources of the ocean floor. A copy of the resolution expressing this position is enclosed. This was adopted by our 1965 National Convention and is still current policy of The American Legion.

I would greatly appreciate your making this letter and Resolution No. 414 a part of the official records of the hearings of your Subcommittee.

Sincerely yours,

HERALD E. STRINGER,
Director.

FORTY-SEVENTH ANNUAL NATIONAL CONVENTION OF THE AMERICAN LEGION,
PORTLAND, OREG., AUGUST 24-26, 1965

RESOLUTION NO. 414

Committee: Foreign Relations.

Subject: United Nations Independent Revenue Opposed.

Whereas there have been advanced various proposals for raising direct revenue for the United Nations, with a view to making that organization financially independent; and

Whereas these include suggestions that the UN be authorized to charge member states for services, to tax individual citizens of member states, to place levies on certain international activities (e.g., mail, shipping, travel), and to exploit natural resources not belonging to any country or resources the claim to which is or might be relinquished by the country or countries concerned (e.g., those of Antarctica, the sea-beds, and outer space); and

Whereas some have advocated that the UN issue a declaration of United Nations title to any petroleum deposits in the Gulf of Mexico beyond U.S. and Mexican territorial limits; and

Whereas under international convention, any such deposits which are technically accessible would be a part of the natural resources of the American continental shelf and belong, therefore, to either the U.S. or Mexico; and

Whereas the United Nations Charter specifies (Article 17, paragraph 2) that: "The expenses of the Organization shall be borne by the Members;" and

Whereas to modify this fundamental principle along the lines of the above mentioned proposals would be a step in the direction of converting the UN into a superstate or "world government;" and

Whereas a financially independent international organization might tend to become less and less responsive to the needs and aspirations of its members, and might be tempted to undertake activities quite unrelated to its basic purposes and perhaps inimical to the best interests of some or all of the nations it is intended to serve: Now, therefore, be it

Resolved by the American Legion in national convention assembled in Portland, Oreg., August 24-26, 1965, That The American Legion opposes 1) the giving to the United Nations title to or revenue from any income producing property, regardless of location but especially the off-shore oil deposits in the Gulf of Mexico; and 2) the authorizing of the United Nations to tax individual citizens of any nation, to place levies upon any member state for whatever services, to issue income-raising stamps, or to charge anyone or any member state fees of any nature for any form of international activity.

THE AMERICAN LEGION,
Washington, D.C., October 30, 1967.

Hon. DANTE B. FASCELL,
*Chairman, Subcommittee on International Organizations and Movements,
House Committee on Foreign Affairs,
Washington, D.C.*

DEAR CHAIRMAN FASCELL: This will supplement my letter of October 10 to you relative to The American Legion's interest in H.J. Res. 816, and related bills.

This matter was discussed in detail during the recent meetings in Indianapolis of our National Executive Committee. I am enclosing for your interest and the interest of the members of your Subcommittee a copy of Resolution No. 22 in which there is expressed The American Legion's specific objection to giving the United Nations control over the ocean floor.

The resolution also supports enactment of legislation similar to the bills before you. I will greatly appreciate your making this letter and Resolution No. 22 a part of the official record of the hearings of your Subcommittee.

Sincerely yours,

HERALD E. STRINGER,
Director.

NATIONAL EXECUTIVE COMMITTEE OF THE AMERICAN LEGION MEETING OF
OCTOBER 18-19, 1967, INDIANAPOLIS, IND.

RESOLUTION NO. 22

Commission: Foreign Relations.

Subject: Oppose Vesting Title to Ocean Floor in United Nations.

Whereas Resolution No. 414, adopted at the Portland National Convention (August 24-26, 1965), expressed the opposition of The American Legion to the giving to the United Nations any source of independent revenue, including the resources of the seabed or ocean floor; and —

Whereas Malta, A UN member, has proposed to the current session of the General Assembly that jurisdiction and control of the ocean floor, and the financial benefits derived from its exploitation, be placed in the United Nations; and

Whereas stories have been circulated to the effect that the United States' representatives will support such plan; and

Whereas several members of the House of Representatives have introduced joint resolutions in opposition to vesting title to the ocean floor in the UN; and

Whereas H.J. Res. 816 and similar bills would also memorialize the President of the United States to instruct our UN representatives to oppose any action at this time to vest control in the UN of the resources of the deep sea beyond the Continental Shelves of the United States; and

Whereas hearings are now underway on these measures before the House Subcommittee on International Organizations and Movements; now, therefore, be it

Resolved by the National Executive Committee of the American Legion in regular meeting assembled in Indianapolis, Ind., on October 18-19, 1967, That The American Legion reaffirms its position of opposition to the giving to the United Nations any properties or resources which would provide it with independent revenue: and be it

Further resolved, That the American Legion shall support the enactment of legislation to express it to be the sense of the Congress that United States' representatives to the United Nations should be instructed to take all steps possible to block any and all moves to place jurisdiction and control of the ocean floor in the United Nations.

(Whereupon, at 1:10 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.)

THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

TUESDAY, OCTOBER 10, 1967

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS,
Washington, D.C.

The Subcommittee on International Organizations and Movements met at 9:35 a.m., in room 2172, Rayburn House Office Building, Hon. Dante B. Fascell (chairman of the subcommittee) presiding.

Mr. FASCELL. The subcommittee will please come to order.

We meet this morning to continue our hearings on resolutions expressing opposition to the vesting in the United Nations of jurisdiction over ocean floor resources.

Since our first hearing, several additional resolutions on this subject have been introduced in the House of Representatives. These are:

House Joint Resolution 843—Hon. Byron G. Rogers, Colorado.

House Joint Resolution 844—Hon. Edwin E. Willis, Louisiana.

House Joint Resolution 850—Hon. Robert L. Leggett, California.

House Joint Resolution 856—Hon. Durward G. Hall, Missouri.

House Joint Resolution 865—Hon. Edward J. Gurney, Florida.

House Joint Resolution 876—Hon. Fernand J. St Germain, Rhode Island.

I should like at this time to ask unanimous consent to add to the listing of the resolutions mentioned above any additional resolutions identical or similar in content that may be introduced after this date. If others are introduced which vary considerably in content from House Joint Resolution 816, the text will be incorporated at this point.

(Note: H.J. Res. 916, introduced by Hon. George Bush, of Texas, October 31, 1967, is identical to H.J. Res. 816. The text of H. Con. Res. 558, introduced by Hon. Jonathan B. Bingham, of New York, on October 25, 1967, follows; House Concurrent Resolution 576, by Mr. Brown of California, House Concurrent Resolution 577, by Mr. Scheuer of New York, and House Concurrent Resolution 580, by Mr. Matsunaga, are identical to House Concurrent Resolution 558.)

[H. Con. Res. 558, 90th Cong., first sess.]

CONCURRENT RESOLUTION concerning the development of the ocean floor through international cooperation

Whereas there are vast untapped resources lying on and below the floor of the world's oceans; and

Whereas such resources beyond the Continental Shelf are not subject to the sovereignty of any nation; and

Whereas the development of these resources through international cooperation could be a boon to mankind providing a source of revenue that could solve the financial problems of the United Nations and could help to meet the desperate needs of the less fortunate areas of the world, which create a dangerous imbalance between rich and poor nations; and

Whereas the development of such resources if allowed to become the subject of rivalry and competition among nations could become a dangerous source of possible armed conflict; and

Whereas the President of the United States has stated: "The wealth of the ocean floor must be freed for the benefit of all people"; and

Whereas the following item has been included on the agenda of the current twenty-second session of the United Nations General Assembly: "Declaration and treaty concerning the reservation exclusively for peaceful purposes of the seabed and of the ocean floor, underlying the seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind": Now, therefore, be it

Resolved by the House of Representatives (the Senate concurring), That it is the sense of the Congress that—

(1) the resources on and below the world's oceans beyond the Continental Shelf should be developed through international cooperation rather than by rivalry among nations;

(2) the President should initiate within the United States Government, and should support at the United Nations and in other appropriate international agencies, such steps as will lead to the development of such resources through international cooperation;

(3) as the first such step, intensive studies should be undertaken as to the most desirable method of achieving this objective, including the possibility of a treaty.

The subject to which these resolutions address themselves is extremely complex and, judging from the number of inquiries and expressions which our subcommittee has received thus far, rather controversial.

On the one hand, there are people who believe that resources located on the bottom of the oceans, like the seas above them, belong to the entire human community and should be exploited under United Nations supervision.

On the other hand, there are those who feel equally strongly that these resources belong to no one in particular and should remain available for exploitation by the coastal countries, including the United States.

What is not clear, at this point, are the ultimate consequences of implementing either of these two propositions.

For example, if the United Nations were given authority to supervise the exploration and the exploitation of resources located on the bottom of the oceans, how far would this authority extend?

Would it come to within 3 miles off our shores?

Would it supersede arrangements embodied in the Convention on the Continental Shelf?

And, what effect would it have on the various extractive undertakings already underway in the North Sea and in several other offshore areas?

In contrast, if the oceans were to be divided between the coastal States on the basis of principles outlined in the Convention on the Continental Shelf, is it not true that two or three countries—particularly France and Great Britain—would become the chief beneficiaries of that approach?

Changing the oceans into "national lakes" could also lead to a great rush on the part of all nations—including some very tiny islands—to claim title to adjacent ocean bottom regions.

This scramble could produce severe international tensions, restrict the United States freedom to operate in all oceans, and have profound repercussions on the entire structure of peace and order in the world.

In brief, the issues involved in the resolutions before us transcend simple economic considerations. They touch the very heart of our national security and have direct bearing on the attainment of some of our major foreign policy goals.

To help us with our task, we are pleased to welcome three distinguished witnesses:

Mr. Clark M. Eichelberger, chairman of the Commission to Study the Organization of Peace;

Mr. Aaron Danzig, chairman of the United Nations Charter Committee of the World Peace Through Law Center; and

Mr. Francis T. Christy, Jr., research associate of Resources for the Future, Inc., who will be testifying in the capacity of an independent expert rather than as a spokesman for the organization with which he is associated.

If there is no objection, I should like to put into the record brief biographical sketches relating to our witnesses, prepared by the staff.

(Biographical sketches follow:)

CLARK M. EICHELBERGER

Chairman, Commission to Study the Organization of Peace. Born Freeport, Illinois, July 29, 1896; graduated Northwestern University, University of Chicago; LL.D. Kalamazoo (Mich.) College, 1964; Lecturer on national and international affairs, Radcliffe Chautauqua System, Washington, D.C., 1922-34; National Director, League of Nations Association (now called U.N. Association of the U.S.A.), 1934-64; Vice President, 1964- ; Director, Committee to Defend America by Aiding the Allies, 1941; Consultant to State Department 1942-43; Consultant to the American Delegation, San Francisco Conference, 1945; served in U.S. Army in WWI; decorated Chevalier Legion of Honor, 1934; Author; "The United Nations Charter: What Was Done at San Francisco"; "UN: First Ten Years"; "UN: The First Fifteen Years", 1960; "UN: The First Twenty Years", 1965. Lecturer and radio commentator.

AARON L. DANZIG

Chairman, United Nations Charter Committee, World Peace Through Law Center. Graduate of Columbia College and Law School. Masters of Law in Taxation from NYU. Has lectured and written in the fields of international affairs, taxation and rehabilitation. Member of the International Law Association and the International Bar Association; recently elected member of the Commission to Study the Organization of Peace. Member of the President's Committee on Employment of the Handicapped for 15 years. Since 1944, a partner in the law firm of Nemeroff, Jelline, Danzig, Faley & Kaufman, NYC.

FRANCIS T. CHRISTY, JR.

Research Associate, Resources for the Future, Inc. Born Brooklyn, N.Y., November 4, 1926; graduate of Yale; M.S. and Ph.D. from University of Michigan; Member of Executive Committee, Law of the Sea Institute; Economics Committee, Marine Technology Society; Economic Advisory Committee of the Bureau of Commercial Fisheries; Consultant, National Council on Marine Resources and Engineering Development; Member, Advisory Panel for Sea-Grant Projects, National Science Foundation. Co-Author of "Trends in Natural Resource Commodities; The Common Wealth in Ocean Fisheries." Author of numerous articles on marine resources.

Mr. FASCELL. I should also like to mention that our hearing will have to be cut short because of the signing of the Outer Space Treaty at the White House at 11. A number of us have been invited to attend, so we shall have to leave here no later than 10:45.

What we would like to do, gentlemen, is to put your prepared statements in the record, if you have one, and ask you to summarize your positions in about 10 minutes each. This will give us an opportunity for some questions.

With that, we would like to begin this morning with Mr. Eichelberger.

STATEMENT OF CLARK M. EICHELBERGER, CHAIRMAN, COMMISSION TO STUDY THE ORGANIZATION OF PEACE, NEW YORK, N.Y.

Mr. EICHELBERGER. Mr. Chairman, I have had the privilege of reading some of the testimony of the previous hearing and have read your statements then and your statement this morning. May I express, if it is not presumptuous, my appreciation of the fairness with which you have outlined all of the implications of this great subject before us.

Further, if it is not out of place for me to say, I am delighted that this session is cut short this morning for the pleasure you will have of seeing the great Treaty of Outer Space signed. It seems to me that another area in which man has not made his sovereign claims, the sea, is even a greater challenge to us than outer space. I would like sometime in the future to have my testimony cut short because you were going to the White House for the signing of a treaty dealing with the sea.

There have been in our time three great areas in which national sovereign claims have not been made or in the case of Antarctica, partially so. Following the explorations of courageous men in Antarctica, there was danger that the vast area be marked by rival territorial claims. Finally, by treaty it was agreed not to recognize future claims. Military bases and fortifications were prohibited.

Then in 1961 in the United Nations General Assembly, a great step was taken to prevent extension of sovereign claims into outer space. The resolution adopted then, and succeeding resolutions, have been incorporated in a treaty, the signing of which you are witnessing this morning.

Today, we are considering a third great area, an area that covers seven-tenths of the earth's surface, where man's sovereign claims have not yet been made. It is an area that man has fought over, he has travelled; he has fished in. However, he knows practically little more about the sea itself that he does about outer space. But suddenly because of man's technological ability to mine the depths, because of the increasing need of its resources, including fish protein, everyone is talking about the sea and its exploration and its control. Consequently the sea presents a very great problem before your committee.

A rational order of the sea must be established if we are to avoid a power struggle and colonial race.

It seems to me that any rational order for the sea must have five objectives: First, it must prevent a colonial race or a power struggle. Second, it must provide for the administration of the sea as a com-

mon heritage of mankind so that all peoples of the world, no matter what their stage of development, may feel they are able to participate in some way.

Third, those who have the capacity to develop and explore must be assured of their rights, the recognition of their courage and the protection of their interests.

Fourth, the development of the sea must be for peaceful purposes only.

And fifth, similar to the provisions of the Outer Space Treaty, the signature of which you are witnessing this morning, the sea must be opened for scientific exploration and investigation on equal terms to all. And, of course, the rational order of the sea must protect the self-interests of the United States.

Let us look at these requirements.

First, the great danger of a power struggle. Unless some rational order for the sea is produced, the maritime powers will be tempted to extend their frontiers and their claims as far as they can. Small states that have not capacity to develop the sea as yet may find it necessary to extend their claims to protect themselves. Courageous entrepreneurs not being sure of protection when they stake their claims in the sea will want their national flag to follow them. This great area could be the scene of a colonial race and a power struggle comparable to the struggle to seize parts of Africa and Asia in the 18th and 19th centuries.

As far as my second and third requirements, they need to be discussed together.

Obviously the world will need the resources of the sea and if men are going to invest their courage, energy, and money to exploit them, their initiative must be respected.

However, to develop a claim at the bottom of the sea is very different from staking out a homestead in the western part of this country. In the old days, a man could stake out a homestead in the West equipped with a burro, a pickax, and some food. That would be about all. But to stake out a claim in the sea would cost millions of dollars and the energy of a great number of men. It would be a very different proposition.

Hand in hand with the need of protecting those who can develop the sea is the problem of many underprivileged countries who will not likely stand by to see this last unclaimed area of the world with fabulous resources staked off by a few maritime powers.

It is my privilege to listen to many of the debates at the U.N. General Assembly. When your colleague, Mrs. Bolton, was a delegate, she was deeply concerned with the problems of the underdeveloped countries and spent much time talking to their delegates.

In the debates at the United Nations, the delegates of these people, day after day, are calling attention to the fact that in the great economic race they are falling behind because the technically equipped powers outstrip them. The U.N. divides its membership, I think, into about 80 so-called underdeveloped countries and about 20 or 30 developed countries. Time after time you hear the representatives of many of these 80 call attention to their economic inequality.

Now, it seems to me that if we are to develop the sea and develop

it in such a way that the rights and interests of the technologically equipped powers are protected, we must at the same time think of the underdeveloped peoples. I do not believe they will stand for an international law which has been written, or will be written, which would preserve the claims of a few and freeze out the many. Mankind is confronted with a most difficult task which should challenge the imagination and humanitarian instincts of this country. The task is to create a rational regime for the sea, which will make it possible for all people to enjoy its heritage; and, at the same time, protect those who can make the greatest contribution in its development.

How can the underdeveloped people participate? I do not know. This is something for the future. Certainly the sea must not be so staked off by a few, that they cannot enjoy their opportunity when they are ready for it; and we must help them be ready to enjoy that opportunity.

In the second place, it may very well be, as the representative from Malta to the United Nations has hinted, that some of the revenue from the exploitation of the sea would go into a development fund to assist the underprivileged people.

I am sure all of us believe that the sea should be used for peaceful purposes only. In the Outer Space Treaty which is being signed today, atomic weapons or other weapons of mass destruction cannot be carried on spaceships or placed on celestial bodies. At a minimum, similar principles could be extended to the broad area of the sea.

Finally, the sea should be open to scientific exploration on the part of all people. In this exploration, the American Navy will play a very important part as the Air Force has played an important part in the exploration of outer space. But it will be in the ways of peace rather than military competition.

Finally, the interests of the United States must be protected. Although this country accounts for about 50 percent of the world's wealth, it has a comparatively small part of the world's population. It cannot go it alone in the development of the sea. However, it has a very great contribution to make. The President of the United States said in a speech a year ago in dedicating an experimental vessel. "Under no circumstances, we believe, must we ever allow the prospects of rich harvests and mineral wealth to create a new form of competition among the maritime nations. We must be careful to avoid a race to grab and hold these lands under the seas. We must be sure that the deep seas and ocean bottoms remain the legacies of all human beings."

This opens a new vista in the development of the world community.

In conclusion, what should be done immediately?

The present United Nations General Assembly is not going to set up an agency to administer the sea. It seems, however, that it could establish certain principles. It should declare that the sea and the bed of the sea beyond certain limits (which would mean a fixed limit to the continental shelf), are not subject to appropriation by any state. I do not think the establishment of this principle should wait until next year or the following year. By that time so many territorial claims may have been made in the sea that it will be very difficult to get things in hand.

One of the most important steps that could be taken would be to insure that this vast area, the sea, not be divided up by sovereign claims

in a colonial race. The world is now going through the agony of the decolonization processes. The cycle should not be repeated.

The second principle to be adopted by this Assembly should state that the resources of the sea should be developed and administered as the common heritage of mankind. And finally, the General Assembly should make it clear that the sea should be developed for peaceful purposes only, and the seas are free for scientific exploration by all states.

Then I would like to see this General Assembly set up a committee to work out the kind of authority that should administer the sea. Now, that agency will have to function with the greatest efficiency. Those of you who have been delegates to the General Assembly know that a parliamentary vote of that body could not administer the sea. But an agency could be set up with the efficiency of the International Bank or the Atomic Energy Commission. Obviously it would be larger than such agencies. The creation of such an agency or authority will take the best brains of our statesmen, of our scientists, our economists and our businessmen some years to work out. All of these elements of American life must contribute to this effort through the United Nations.

I would not attempt to outline the kind of an agency that should be created. But I want to say that unless one is created, the world will be faced with anarchy, with untold competition, which could deprive the United States of the very security which it needs to develop the sea's resources.

So I say in conclusion that for us to establish a rational order for the sea in which the resources would be developed for all mankind is a new concept of international relations. It can well command your attention.

Thank you.

Mr. FASCELL. Thank you, Mr. Eichelberger. I appreciate your summarizing so eloquently and succinctly the principles you would like to see embodied in the resolution; also for outlining for the record the five basic principles, as you see them, which should form the basis for a discussion of this entire problem.

I am going to address a question to you which perhaps can be answered by the other witnesses, too, when they get an opportunity.

It is: Haven't we already made a decision in this area? Doesn't the Convention on the Continental Shelf represent such a decision? Isn't the action in the North Sea by coastal states a decision in international law? Would not the declaration of principles which you have outlined fly in the face of actions already taken?

Mr. EICHELBERGER. Mr. Chairman, the gentlemen on either side of me will be able to speak on that subject. I know that Mr. Danzig, who succeeded in getting a very important resolution on this subject through the World Peace Through Law Conference in Geneva, is prepared to discuss President Truman's step in outlining the continental shelf and the problem of the continental shelf.

Mr. Christy has prepared a map which, I think, will show the confusion that could result if sovereign claims were carried out to the mid-point of the ocean. I have not seen his statement, but I would hope—

Mr. FASCELL. Since we are short of time, let us hear from the other witnesses in turn, and then we will interrogate.

Mr. Danzig.

**STATEMENT OF AARON L. DANZIG, CHAIRMAN, UNITED NATIONS
CHARTER COMMITTEE, WORLD PEACE THROUGH LAW CENTER,
NEW YORK, N.Y.**

Mr. DANZIG. Mr. Chairman, my primary purpose in testifying before the committee today is to make clear the action taken by the World Peace Through Law Conference on July 13, 1967, and the implications involved in that action.

That was a conference of some 2,500 lawyers and jurists from more than 100 countries of the world.

Now, I want to make it clear, first, however, what the action of the conference did not imply, and in this connection I will address myself specifically to one of the questions the chairman propounded.

First of all, it is not contemplated that individual initiative in exploiting the resources of the sea will be limited or taken away. There is a great distinction between orderly supervision for the benefit of all and a chaotic individual race to seize all available riches unsupervised by any supranational authority.

What is contemplated would be a system similar to that employed by the United States in connection with the exploitation of its own continental shelf. This has already resulted in millions of dollars of income to the United States not at the price of limiting or discouraging individual initiative, but, to the contrary, encouraging and expanding it. This approach is achieved simply by leases and royalty agreements on the continental shelf.

Secondly, the proposal will not affect the national defense of any country. The sovereignty of the United States, so far as its defense is concerned, extends only so far as our territorial waters, which under U.S. interpretation extends a distance of 3 miles from shore. This proposal does not in any way affect territorial waters, and that is one of the questions that the chairman propounded. Nor, in fact, does it affect any part of the continental shelf. In fact, it does not concern itself in any way with military limitations or regulation, since it deals only with the nonfishery resources of the high seas beyond the continental shelf.

Third, the proposal does not seek in any way to interfere with or change any of the laws or regulations or, in fact, to change any of the present-day practices with reference to the fisheries of the world. These are specifically excluded from the proposal and are covered by international law as embodied in the 1958 Convention on Fisheries. These are specifically excluded from the proposal and are covered specifically by international law.

Fourth, the proposal does not take anything away from the United States that the United States presently owns or occupies. It is directed toward the five-sevenths of the earth which is the common heritage of all mankind and designed only to protect it for the benefit of all mankind—and I refer to the resources of the sea beyond the continental shelf.

Now, in order to place this entire problem in proper legal perspective, let us take a geological and legalistic trip starting with the shoreline of any country and proceeding to the depths of the ocean.

As we start out from shore, we see a gently sloping area known as the continental shelf. If we were to take this journey a hundred years

from today, and I hope we will all be here to take it, we would get into a monorail train somewhere down at the harbor of Chesapeake Bay, soon splash under the water and after being stunned by the myriad of colors, particularly the brilliant greens of the water and the marvelous colors of the undersea fauna, we would observe that the shelf that I have just been talking about would be a very busy commercial area. It would be dotted with hundreds of wells and derricks drilling oil and gas.

We would see tremendous fish farms surrounded by electric bubbles where billions of fish would be bred to yield marine protein concentrate to feed all of mankind. We would see gigantic refrigerator plants taking advantage of the unchanging cool temperatures. We would see tremendous mechanisms for converting sea water not only into drinkable form but into form that will irrigate our now parched deserts.

We would see freight cars in unending chains proceeding under the water, not subject to storms or weather conditions, between here and Europe as well as the other continents of the world. In short, we would be seeing what in good sense this committee is foreseeing by virtue of its decision to hold hearings on this important subject matter.

As Mr. Ambassador Goldberg stated only a few weeks ago before the First Committee of the General Assembly, development of the ocean resources is still in its early stage but promises much for human benefit and it requires "that we nations of the world, through this organization, address ourselves to our tasks in cooperation and not in conflict." It can be a tremendously important subject.

Now, the continental shelf that I have been talking about extends for a distance of from 8 to 800 miles, but is on the average about 42 miles in width and before we get off the shelf, let's go back and take a legalistic look at the land that we have just traversed.

For a distance of 3 miles from shore, as I have previously stated, there exists what is known as the territorial sea. This sea, according to the U.S. interpretation, is 3 miles in width, although there are other countries that argue that it's as much as 12 miles in width. As to this area, there is absolute sovereignty and all determinations with reference to this area are made by the coastal country.

Now, it is well known in law that where sovereignty exists, it extends to the sky and to the center of the earth so that there is no doubt that the bed of the sea under our territorial waters belongs to the United States and we have sovereignty over the same.

Now, as we proceed outward from the territorial waters, bearing in mind that the continental shelf is on the average 42 miles in width, the question arises as to who has jurisdiction over the sea bed in the continental shelf. Bear in mind that we are now out in the high seas, because as far as the waters are concerned, once we pass the territorial sea we are in the high seas.

We are looking at this juncture at the bed of the sea on the continental shelf under the high seas, and as to this area our country took the lead in 1945 by promulgation of what was known as the Truman proclamation in which we asserted jurisdiction over the resources of the continental shelf, and this proclamation was followed by similar proclamations by other countries and, in turn, resulted in

what, as the chairman has mentioned, is known as the 1958 Convention on the Continental Shelf, which, I believe, has been endorsed by some 30 nations.

Briefly, this convention recognizes the exclusive right to exploit its continental shelf by each coastal nation. It is not the purpose of this proposal to disturb that rule of law in any way.

I wish to stress very strongly here that there was no significant legal precedent for President Truman's action nor did he rely upon any. His action was a creative approach to a vacuum in the law.

Now, if we could get back on our train, we had better prepare for a hair-raising descent because, as we reach the edge of the continental shelf, we plunge thousands of feet down the side of a steep incline known as the continental slope, which declines to the ocean bottom anywhere from 2 to 3 miles, that is, 10,000 to 15,000 feet below the surface of the water.

You will observe that the heat goes on in our train because the temperature now gets as low as 2 degrees, and the light gradually changes from green to midnight blue, and finally all light is gone, and we are surrounded by darkness.

Now, as mysteriously wonderful as the continental shelf might be, the area we are now approaching is even more intriguing. Here we see large aqua-domed communities populated by workers whose occupations bring them to these areas and by large numbers of our population seeking recreation and respite from the trials, turbulences, and pollution of dry land.

They hunt whales and squid and octopi, but we are amazed to discover that in these hidden depths lie untold treasures which redound to the benefit of every human being, for here in the bed of the sea lie manganese fields extending for millions of acres yielding manganese, copper, nickel, and cobalt.

Here lies as well—according to John Mero, a well-known expert in the field—here lies “iron, molybdenum, vanadium, diatomaceous earth, limestone, and other metals.” These minerals are likewise found in gigantic quantity on the continental slope we have just discussed, as well as oil and gas in tremendous quantity.

There now arises in the world a question as to who shall own and exploit the continental slope and the deep ocean floor. This is the crux of the question.

As to this, there is the same vacuum in the law that there was with respect to the continental shelf before the Truman proclamation. As to this, there is no law and the essential question is: To whom should these resources belong?

Should there be a wild scramble in which every person and every nation seeks to get whatever it can, what I call “submarine colonialism,” and what would be the undersea equivalent to what happened to Africa in the last quarter of the 19th century, or will this area be the common heritage of all mankind?

Now, it is in this setting and with this background of knowledge that the World Peace Through Law Conference on July 13 adopted a resolution urging a proclamation declaring that the resources of the high seas beyond the continental shelf appertain to the United Nations or, briefly put, urging the international counterpart of the Tru-

man proclamation. This was followed by the action of the Permanent Mission of Malta to the United Nations, adding this to the agenda of the General Assembly of the United Nations.

Both of these actions are vectored toward two objectives—the efficient exploitation of the sea for the benefit of all, including private entrepreneurs and, secondly, toward improvement of the lot of mankind as a whole.

I needn't argue our interest in the first objective. We have a real interest in the second objective as well. We now spend \$4.5 billion a year (including our food programs) toward that second objective, because we know that the better off the world is, the better off we are. We also know that, in the long run, peace is never fully assured in a world where half of its inhabitants cannot learn the truth because they are unable to read or write, or appreciate the fruits of freedom and democracy because they are too hungry to think of anything else other than staving off starvation.

I observed a statement by President Johnson in yesterday's Washington Post. He put it most strongly:

These are most disturbing facts in the 20th century, in this, the richest age man has ever known. They are the facts which cry out, "Shame on the world. Shame on its leaders."

The time is now.

Almost every day reveals a new discovery, a new depth plumbed by man in the sea—not just by us, but by other countries as well. Almost without our knowledge "submarine colonialism" has already begun. Will the world watch hopelessly while the sea is carved to bits by nations and individuals intent on their own private interest or will it be conserved for the benefit of all mankind, including the United States?

Gentlemen of this committee, I say that our President has summed up the answer in a single paragraph, and I repeat the words that Mr. Eichelberger has already stated to the committee. These are the words of President Johnson:

We must be careful to avoid a race to grab and hold the lands under the high seas. We must be sure that the deep seas and ocean bottoms are, and remain, the legacy of all.

Thank you.

Mr. FASCELL. Thank you, Mr. Danzig. You used a very individual crystal ball in taking us on an exciting trip and clarifying some areas about which there seems to be some concern.

Mr. Christy?

STATEMENT OF FRANCIS T. CHRISTY, JR., RESOURCES FOR THE FUTURE, INC., WASHINGTON, D.C.

Mr. CHRISTY. Thank you, Mr. Chairman.

I would like to begin briefly by clarifying the sense of urgency and prematurity which has been discussed in a number of reports in this area.

I think it is misleading to deal with this as a single problem. To me there are really a range of decisions that have to be made and the timing becomes critical for some and less critical for others.

There is, I feel, no necessity to arrive at an "ultimate regime," whatever that is. I think that would be premature, as Mr. Eichelberger stated.

In the first place, there is no such thing as any ultimate regime; regimes continue to change. In the second place, they are made up of a series of decisions and rules that have to be made over time.

There is, however, urgency in maintaining options open to us for the future or in preventing the foreclosure of options, and I think that certain steps must be made fairly soon to make sure that this is the case.

There is also urgency for discussion of the different rules that are required and it is for this reason that these hearings will be so valuable.

In this context, I offer my remarks. My approach is primarily from the point of view of economics and what would be economically efficient, recognizing, of course, that economic criteria are not the only bases for decisions of rules in law.

I would like to touch briefly on the criteria that we will have to consider in evaluating the different decisions that have to be made, and then discuss within a very broad framework the different kinds of alternatives that exist, recognizing that these are an array of alternatives and not by any means clear cut.

In terms of the criteria, there are two general ones that I think are important.

The first is that of economic efficiency. What kind of rules or decisions do we make that will permit the most economically efficient operations on the resources of the sea? The second is that of acceptability. What kinds of rules can be arrived at that will be acceptable and that will permit a viable and stable regime over the long run?

In terms of economic efficiency, I cast this in broad terms; that is, the efficiency not only to the producer but to society as well. And the primary consideration in all of these is the necessity that the producer must have exclusive rights to the resources which he exploits.

Exclusive rights can be discussed in various terms; the right to the resource after capture, the right to the resource on the bottom, to a resource area, to exploration and in many other ways. Essentially, however, what is necessary is for an exploiter to have sufficient rights in size and tenure to guarantee an appropriate return on his investment. This is the absolute minimum.

The second element of the economic efficiency criteria, I think, is the allocation of productive resources. I do not think that the developers of the minerals of the sea should either be penalized or subsidized more than those who are producing the same materials from the land. And in addition, I think it is better to have a monetary basis for distribution and allocation of these mineral resources than some arbitrary basis, such as political force.

This means that some form of ground rent may have to be paid. This would emulate insofar as it can, the marketplace, and approximate the way the resources of oil on our continental shelf are distributed.

In addition, I think that in striving for an economically efficient set of rules, we should avoid any incentives to "high-grade" the resource; that is, to strip off the cream of the crop, and we should also prevent external costs to the extent possible; that is, the interference with other forms of activity or pollution of the environment.



In summary, the most essential element of any set of rules is the best guarantee of exclusive rights that the exploiter will need to operate efficiently on the sea floor. In am talking here primarily of the area beyond the edge of the continental shelf.

Now, the second criterion is that of acceptability and how we can arrive at sets of rules that will be, in the long run, acceptable to those nations which will have an influence on decisions.

I think both of these criteria are exceedingly important in discussing the rules and regulations. Obviously security is also another important criterion and the question of scientific exploration and many other criteria that can be brought into consideration.

I will now suggest the different alternatives in very broad terms as a basis for discussion. I can see that there are four possibilities. Actually I think the final result will be a mixture of several of these; it will be made up of an array of decisions, but for simplification purposes I will outline these four as if they were distinct.

One is, let's wait and see what happens. Let's leave the present rules as they stand, and let the experience develop and the law follow that.

The present rules governing the operations beyond the edge of the continental shelf are simply those of exploitability and adjacency. We can acquire exclusive rights out as far as we can exploit so long as there is some degree of adjacency to our coastal waters. This is the essential meaning of the Geneva Convention on the Continental Shelf.

Now, the limits perhaps are already extended beyond the 200-meter isobath. Fifteen nations have already licensed mining operations beyond this depth. The United States has licensed operations off the coast of California in 4,000 feet of water 40 miles from the coast, and off the coast of Oregon, 30 miles from the coast, in 1,500 feet of water. So essentially we are already, through the criteria of exploitability and adjacency, pushing out the limits of the coastal states' rights.

The effect of this is like lowering the water in a bathtub. When we extend our rights into, say, 4,000 feet of water, all other nations acquire the same rights under the principle of the Geneva Convention. This may be reasonable in terms of small increments, but there is certainly question as to when we abandon the principle of adjacency and move beyond. Also, in terms of large steps, there is a question of who has the right to resources beyond the coastal states' limits (however defined), and this, I think, actually does act as a deterrent at the moment to the exploration and exploitation.

The second approach is the national lake approach. If the first approach were followed to its ultimate conclusion and the principle of adjacency were abandoned, we would arrive at a situation something like this [pointing to map] or some other scheme under which there is a division of the sea floor among the coastal states.

(The map referred to facing this page shows division of the floor of the oceans along lines every point of which is equal in distance to the nearest points of adjacent or opposite coastal states, including islands.)

The scheme that I have presented here is simply on the basis of median lines as proposed in the Geneva Convention. That is, along these lines every point is equal in distance to the adjacent or opposite coast of the state.

Mr. FRASER. Mr. Chairman, I wonder if our witness might point to the map and some of the lines that would be of interest to the United States. They are not too easily seen here, so if you could actually point—you might reemphasize again what those lines represent.

Mr. CHRISTY. Yes, this actually is on the basis of the Geneva Convention; as I said, there are other ways in which the seas might be divided. Under the Geneva Convention, islands have the same rights as coastal states do. It is on this basis that lines have been drawn. For example, you take this line off the U.S. shore in the Atlantic. This point along here is equal in distance between the closest point of the coast of the United States and of Bermuda.

The Bahamas lie down here, so the line goes in close to our shores.

Clipperton Island is a small desolate rock belonging to France, 500 miles south of Mexico. This acquires vast territory in the eastern Pacific. Other systems might be developed for dividing up the oceans of the world but they all run into certain difficulties.

If we could eliminate the islands this would raise questions as to what rights would attach to Hawaii and to the Aleutians.

I think that the main difficulty with this system is that the Soviets would gain such little territory, and this would make such a regime very difficult to get accepted in international law.

In addition, I would think that the U.S. Navy would tend to reject this kind of a division of the sea floor. Even though it may be simply for minerals and the right to exploit the minerals, it might eventually lead to restrictions on the mobility we value so highly for security and defense.

The third approach is a flag nation approach, and this is essentially a temporary solution. Under this kind of situation the nation guarantees protection of its individual exploiter wherever he chooses to operate.

This might lead to a headlong race to claim rights by various nations unless certain international rules were established. International rules, such as performance requirements, for example, would mean that rights can only be held so long as the exploiter is producing. Such controls might have the effect of preventing the less developed countries from participating, and there would be a question as to whether or not this would be acceptable.

Also, there is the question raised by this system of how you allocate resources where conflicts occur. The minerals on the sea floor are not uniformly valuable. There are certain sites which are far more valuable than others and these are the sites where conflict will develop. If there is competition or conflict for the same site, how do you resolve it under this kind of system?

Eventually I think, therefore—and those who have advocated the flag nation approach feel this is inevitable—there will have to be some form of international solution.

This leads to the fourth alternative—an international solution—for which there is actually a range of alternatives. One extreme might have the United Nations operating and digging up the resources. I do not think this is at all desirable.

The other might be simply an international registration office and I think this has drawbacks as well. But some international solution

must be developed under which limited rights, rights simply to exploit the resources, can be obtained by the entrepreneurs who wish to exploit. This to me at the moment would actually provide the best guarantee to the exploiter and would permit the nations to operate as freely and widely as they choose. I would suggest, in the interest of economic efficiency, that there should be some bidding mechanism under which the exploiters would apply and bid for the right to operate. This bid would reflect the value of the property to the producer and it would be similar to the operation on the U.S. Continental Shelf.

Let me approach the problem in a very different way in summarization.

What mechanism should be formed to allocate these resources to firm A or firm B or nation C when there is competition for the same resource area?

If it is on a first-come, first-served basis, this could develop into a race unless there are controls. If there are controls, then it may be unacceptable to the world community and we will not have a stable and viable regime. We could also allocate these resources by force. I don't think this is good. We could do it by agreement, and this leads us into a box. If we begin by allocating and resolving conflicts between nations on the basis of bilateral or multilateral agreements, we will be setting a principle whereby these resources are divided on an arbitrary basis and I know this is not what we want to do. So the final method of allocating, I think, is simply by the marketplace. Let those producers or nations bid as they want to and let the monetary operation work to divide the access and the rights to the resources.

Thank you.

Mr. FASCELL. Thank you very much, Mr. Christy.

Gentlemen, I want to thank all of you for coming here this morning and giving a new dimension to our consideration of this entire problem. I appreciate Mr. Danzig and Mr. Eichelberger coming down from New York.

I think it has not been made sufficiently clear until now that we are talking about at least three different things. As always, the biggest problem in communicating is for everybody to talk in the same language. I want to be sure that we are talking in the same language, at least on this record.

For this reason, let me ask:

Is there general acceptance in the international community of what constitutes "territorial waters"?

Mr. DANZIG. May I address myself to that?

Mr. FASCELL. Mr. Danzig.

Mr. DANZIG. While there is no general agreement in specific terms, I would say that as to total outer limits, the vast majority of all international law experts say that it does not extend more than 12 miles from shore.

Mr. FASCELL. But we have no complete agreement in international law as to what constitutes territorial waters?

Mr. DANZIG. Well, if by agreement you mean something written down in a treaty, no. But if you mean the general opinion of international scholars, yes. As far as the United States is concerned, the United States has consistently defined the territorial waters as ex-

tending 3 miles from shore and the United States showed some disposition in 1958 to enlarge that definition by saying that the territorial waters would extend 6 miles from shore with fishing rights extending 12 miles from shore, but, again, may I say to the committee that the area under discussion could not possibly involve any of those definitions.

Mr. FASCELL. Well, I am not sure that I am ready to agree with that statement as yet, Mr. Danzig. If we have no international law except by the opinion of scholars; if there are other ways of making international law—for example, by force or by agreement—and if some countries are claiming territorial jurisdiction beyond the point which the United States is willing to accept, then I think we have a problem.

Certainly we have been struggling with this issue for many years, and as you know we have not reached any definitive decision on it to date.

Mr. DANZIG. That is correct.

Mr. FASCELL. So, it would seem to me that we have not finished with the first step as yet. Unless we have a hard and fast agreement on the definition of territorial waters how can we go to the next step and determine what constitutes the continental shelf, and who has sovereignty or jurisdiction over the continental shelf?

Mr. Eichelberger?

Mr. EICHELBERGER. I believe the 3-mile limit was usually considered the limit, but by act of Congress the United States and others have extended this to 12 miles.

It is interesting that whereas representatives of Malta and our Government and the majority of governments felt that the agenda item on the sea should go to the First Committee as an important political issue, some of the Latin American states which had been extending their fishing rights several hundred miles into the oceans wanted it to go to the Legal Committee. Probably it was felt that a long legal argument is the most that would be accomplished at this session. I would agree with you, sir, that we have to hold to very limited territorial seas.

Mr. FASCELL. I didn't know that I was making that assertion Mr. Eichelberger. I am not sure I am ready to make that decision yet. It seems to me I was just pointing out that some basic issues remain to be resolved. You have raised another problem here, of course, by referring to some coastal states which wish to extend their fishing rights some 300 or 400 miles offshore.

Are we talking now about jurisdiction? Or sovereignty? Are these claimed offshore areas territorial waters?

Well, now, I see Mr. Danzig shaking his head. Yet I think a legal case probably could be made, whether or not it has any foundation or acceptability in international law, certainly a coastal state could make such a claim. Whether it would succeed in getting it accepted is another matter.

Mr. EICHELBERGER. Mr. Chairman, that is the whole basis of my argument, that we establish as quickly as possible an international regime to prevent these fantastic claims being made.

Mr. FASCELL. Covering all of these points?

Mr. EICHELBERGER. Yes, I don't think we can establish over night the final U.N. agency that would administer, or whatever phrase you wish to use.

Mr. FASCELL. You see, your statement changes something. I had understood from Mr. Danzig that we were not really talking about territorial waters or the continental shelf, but about the continental slope and beyond.

Now I find that in order to talk about the continental slope, I must first know what constitutes territorial waters.

Mr. CHRISTY. I don't think that is necessarily true, Mr. Chairman. We are talking about different kinds of rights and within the territorial waters we have full sovereignty except for passage. Beyond that on the continental shelf, the present regime which is accepted is that we have rights to exploit the resources on the floor of the continental shelf. This is a limited right and does not interfere with the superjacent waters for use of fishing or for other purposes.

Beyond that we, I think, want to have a system again of limited rights.

To me the question of urgency is this, that is, the demarcation of the extent of these limited rights to the resources of the sea floor. I think they should be limited quite clearly, but unless we arrive at some decision on this fairly soon, we might find ourselves in this kind of a box [pointing to the map]. That's what I meant by preserving options.

Mr. FASCELL. When you refer to this kind of a box you mean the division of the ocean floors by——

Mr. CHRISTY. Under different national jurisdictions.

Mr. DANZIG. May I say, Mr. Chairman——

Mr. FASCELL. Mr. Danzig.

Mr. DANZIG. I would say that the territorial waters are fairly well boxed in by the 1958 convention on territorial waters and contiguous zones. While the territorial waters were not described or defined as to width, the contiguous zone—which I did not want to go into, because I did not want to unnecessarily complicate the legalistic analysis, but this is a zone in which all countries have limited rights—fiscal, sanitation, customs—that the contiguous zone includes, I would say, a fair reading of that convention, includes the territorial sea and the contiguous zone within a limit of 12 miles from shore.

Now, Mr. Chairman, there are, after all, more than 125 nations in the world, and you are always going to have some extreme claims made by some small countries, but that doesn't necessarily mean that because some people take outlandish positions that the world's progress must stand until these countries' positions are limited.

I don't think that the world community would recognize anything further than 12 miles as a territorial sea.

Now, we have, as we have seen, also observed that the continental shelf beyond that is already fixed as to the right to exploit the same by the 1958 convention, and we are talking about the area beyond that, not just the deep declining slope, but the bed of the ocean which is five-sevenths of the surface of the earth.

Mr. FASCELL. So, in our definitions we have to draw a further distinction between the "continental slope" and the "bed of the ocean."

Mr. DANZIG. That is right.

Mr. FASCELL. Mr. Gross?

Mr. GROSS. Thank you, Mr. Chairman. Is it proposed to continue this hearing until we have questioned the witnesses, or is it to be adjourned for the festive occasion at the White House?

Mr. FASCELL. Well, Mr. Gross, I plan to stay, if that is what you are inquiring about; anybody else who would like to go—

Mr. GROSS. I would like to reserve my time, and yield to the gentleman from New Jersey since I am not going to the White House.

Mr. FASCELL. Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. I thank you, Mr. Chairman, and Mr. Gross also, because I do hope to get down to the White House to witness the signing of this treaty. I suppose this ceremony could be described as festivities at least as far as Mr. Eichelberger is concerned.

I would like to get back to the question of urgency, and put myself momentarily in the shoes of a sponsor of this resolution. I am not one and I don't intend to introduce such legislation.

I believe Mr. Gross is the only member of this subcommittee who has done so.

I would suppose that one of the reasons why this legislation has been introduced is because of the fear that some action may be taken at this session of the General Assembly which may deprive this country of something. The sponsors may feel we should not take any such step until we look carefully at what is being proposed.

Mr. Eichelberger mentioned the importance of an international agency to prevent fantastic claims from being made, and Mr. Danzig just now talked about the fact that there will always be some wild claims from some small country.

Well, I would propose that the proposal by Malta may be interpreted as a claim by a small country on behalf of a lot of undeveloped countries, to deprive the developed countries with the technical know-how to handle this exploitation of their legitimate expectations.

My question is whether these small nations might try to issue a proclamation along the lines that Mr. Danzig is advocating. Might not a resolution be approved saying that from now on all this area is going to appertain, I think the word is, to the United Nations, and any deep sea resources henceforth are to be available only for the less developed countries.

Might not the little countries see this as a source of funds comparable to what the so-called rich countries already have, which they might take over as their exclusive preserve under U.N. auspices? I think someone called the Malta resolution the "last straw," that led them to make an effort to prevent any favorable reaction on our part to such a proposal.

Do any of you think that such a development might come about? Might not the little countries say that now is the time for us to prevent any ganging up on the part of the exploiting powers of these resources? Might they not feel the thing to do is to take action now before the bigger powers develop that pattern?

Isn't that a possibility, an early possibility at the U.N.? Might they not seek such a protection against exploitation or colonialism by these big countries?

Mr. Danzig has said there will be no interference in any way with the rights of those countries who are able to exploit, but it is con-

ceivable that action by the U.N. would be in the form of depriving the countries able to exploit of that right. There might not be any power in the U.N. to develop these resources on its own, except for such arrangements as they might arrange with exploiting powers.

Is this a real possibility?

Mr. DANZIG. I have heard no one take that position in support of this resolution.

The contrary is the position taken by all those with whom I have had an opportunity to discuss the matter, which is simply that there not be an individual question or an individual nation question or that it be open to all nations and that individual entrepreneurs not be discouraged.

Mr. FRELINGHUYSEN. If I may interrupt, the Malta proposal does say, I do not have the language in front of me—does say something about reserving a segment—

Mr. DANZIG. No, Congressman Frelinghuysen, it is attached—

Mr. FRELINGHUYSEN. Some reference to the lesser developed countries.

Mr. DANZIG. It is attached to my statement. I took the precaution of adding the memorandum and I think that the language that you are referring to are these words.

If you will look on the memorandum, which is the second page, page 2, subparagraph (c), the last sentence talks of the net financial benefits derived from the use and exploitation of the sea—"shall be used primarily to promote the development of poor countries," and what the Malta provision contemplates is precisely what Mr. Christy was talking about, that these areas, just like the United States exploits its present continental shelf, would be leased by open bidding available to all and that from these leases or royalties there would be income forthcoming that would redound to the benefit of the poor countries of the world as well as all countries, in my opinion.

I do want to say a word about the permanent mission of Malta, because I have had an opportunity to discuss this matter at length with them.

I believe that they are impelled and were impelled to introduce this resolution by a careful and thoughtful study in depth of the problem and with no ax to grind or no selfish interest at heart.

Mr. FRELINGHUYSEN. That may be, but the language to which you referred is what I was seeking. This is not the language of the resolution, this is the language of the memorandum describing the resolution?

Mr. DANZIG. Right.

Mr. FRELINGHUYSEN. It says that the net financial benefit shall be used primarily to promote development of poor countries. I am not sure what "net financial benefit" means, but it could mean the proceeds of any exploitation, the net proceeds. What are net proceeds? You describe this as a royalty, the right of exploiting should provide for some kind of ground rent. However, this language could be interpreted so that the proceeds shall be used to benefit the poor countries only. This could be interpreted as a deprivation of at least part of the resources for the exploiter, and it might reduce the initiative to zero.

Mr. DANZIG. Yes, I agree that the language is ambiguous, but that, as far as I know, is not the intention of the resolution.

Mr. FRELINGHUYSEN. Mr. Eichelberger looks as if he is anxious to say something.

Mr. EICHELBERGER. I believe that in a statement to the Assembly on Friday the representative of Malta said that the title to the item on the agenda, which is the only prevailing thing, rather than the memorandum, was to be revised by agreement with the South American states to eliminate reference to a declaration or a treaty, so it really is a study concerning the reservation exclusively for peaceful purpose of the seabed and the ocean floor underlying the seas beyond the limits of present national jurisdiction and the use of their resources in the interest of mankind.

Now, no resolutions have as yet been introduced. I presume a resolution may be introduced in which a great number of the underdeveloped countries would participate.

Ambassador Goldberg supported putting the item on the agenda, and that it go to the First Committee, but took no position on the merits of the suggestions in the memorandum. He said at the appropriate time the U.S. delegation would have some concrete proposals to make.

So, it seems to me that the delegate of Malta wants to be sure that the seabed is not grabbed off by sovereign states; that a military race does not develop, and that in some way the resources be utilized for the development of mankind. I don't believe he in any way contemplates that people who are willing to develop the sea will not have any chance to do so.

The Malta Prime Minister's speech on Friday indicated there may be thoughts about licensing so there would be some money for the development of the developing countries.

Mr. FRELINGHUYSEN. This would be an indication that they have modified their position to take into account the apprehension of some countries who might be left out.

Mr. EICHELBERGER. He has taken into account the problems of the Latin American states. Again, to repeat, I would hope this U.N. General Assembly would go so far as the declaration of 1961 on outer space that the bed of the sea is not subject to appropriation and its resources are to be used for mankind. Let's get some broad principles established. Then it will take some years to work out the mechanisms for the operation that Mr. Christy suggests.

Mr. FRELINGHUYSEN. I want to thank all three of you gentlemen for your testimony. I think it would have been better if we had given a morning for each one of you.

Mr. FASCELL. Mr. Fraser?

Mr. FRASER. I am going to have only a minute of questions because I am trying to get down to the White House.

I understand that Malta through its resolution would be giving up a substantial part of her claim to the Mediterranean under the prevailing rules depicted on the map. Am I substantially correct in that? I don't know the geography of the Mediterranean very well, but—

Mr. CHRISTY. You are raising a question of what happens to the great seas, and that was a division I did not attempt on the map.

Mr. FRASER. Looking at your map, it would be generally said that an island is in relatively good position under the interpretation reflected on the map to make an assertion to the rights over quite a wide area, so that without reference to the specific geographical location, Malta surely is not gaining anything through the sponsorship of this resolution, I would assume?

Mr. CHRISTY. It might be a question of whether or not she interprets the great seas, and the Mediterranean particularly, as coming within the treaty under the study.

Mr. DANZIG. Excuse me, Congressman, but I wonder if we could correct one thing that I think is a misunderstanding. Mr. Christy, in addressing the question to you, the Congressman stated that these lines that you have drawn were the prevailing rule.

Mr. CHRISTY. That's true.

Mr. FRASER. That's assuming that under the 1958 convention the technology will exist that will permit the countries to assert the claims out as far as the convention would permit, which as I understand, turns out to be limited by median lines.

Mr. DANZIG. I would disagree with that point emphatically.

Mr. FRASER. What would you say?

Mr. DANZIG. I would say that the Convention on the Continental Shelf was limited to what was contemplated by the covenanting parties in 1958 and at the same time the exploitation of the continental shelf was not seen as very practicable beyond the 200-meter limit.

Mr. FRASER. But by the language of the convention——

Mr. DANZIG. Yes, I am aware of the language, but I am also aware of the circumstances in which the language was drawn and, in my humble opinion, there is no international authority who would support the position that under the present Convention on the Continental Shelf that the right to exploit the resources of the ocean go out to the midpoint between any continental shelf and the opposite continental shelf.

I do not accept these lines as the rule of law at the present time.

Mr. FRASER. Well, I'm only pointing to the fact that, as I recall it, the convention defined the continental shelf as out to a depth of 200 meters plus, in effect, such further distance as technology may permit exploitation. I am assuming there is an enlargement of our technological capabilities, but what you are saying is that this goes far beyond the context in which the convention was drawn, so there is, in fact, this vacuum that you described in your statement.

Mr. DANZIG. Yes.

Mr. CHRISTY. I think there is another operative word and that is the word "adjacent." This produced the principle of adjacency, so I agree with Mr. Danzig that the convention should not be interpreted to permit division at midocean. My map has been drawn as if the criterion of adjacency were abandoned.

Mr. FRASER. I would assume "adjacent" would mean contiguous, anything that starts from your shoreline or from the territorial waters. In any event, I was trying to get to the point I am bothered with, that there has to be suspicion attached to any nation that tries to provide any leadership in the international field that they are out for something for their own pockets. It seems to me this is the kind of thing that

makes things go sour, and I have seen nothing that suggests to me that Malta is interested in anything except developing a more intelligent, rational approach to the disposition of these resources.

The last point I wanted to make was that if the resources that are exploited should accrue to the United Nations and used for the developing countries, and purely hypothetically, if this should become the source, for example, to fund the United Nations development program to replace the \$185 million that was pledged recently, then it seems to me that the United States stands to be the major beneficiary since we are the major donor in the development programs.

So that the only way one can say that the rich nations are being cheated if the U.N. gets this money is to say that the rich nations otherwise have no intention of doing anything to help the world, and I know that some people would just as soon forget about the world. But it was interesting when the foreign aid bill went through the House that the voluntary contributions to the United Nations was one of the few items that was not cut.

So there is some support in trying to build an international community. I have to go and if I ask you another question I won't get out of here.

Thank you very much.

Mr. FASCELL. Mr. Gross?

Mr. GROSS. Thank you, Mr. Chairman. I would like to get one thing squared away that I am always curious about.

Mr. Danzig, have you or your law firm in New York done any contract, consultant, or research work for the Federal Government?

Mr. DANZIG. No.

Mr. GROSS. You, Mr. Christy, your firm? I believe you are a research associate for Resources For the Future, Inc. Do you hold any contracts with the Federal Government for—

Mr. CHRISTY. In a sense—

Mr. GROSS (continuing). Consulting or research work?

Mr. CHRISTY. Yes, we do. I personally am, as you will see from my biography, in a consulting capacity with the Marine Science Council, and with the sea grant college program, and also a member of the Economic Panel for the Bureau of Commercial Fisheries.

Our organization is doing a cooperative project with the Office of Science and Technology on decisions with respect to the resources. Our organization, by the way, is a nonprofit, private corporation, undertaking research on national problems.

Mr. GROSS. Yes; we have considerable experience with nonprofit research organizations. I happen to be on the Manpower Utilization Subcommittee and we find them numerous, working with the Federal Government. I will not go further into that at this time.

Mr. Eichelberger, how much authority would you vest in the United Nations over the deep sea bed?

Mr. EICHELBERGER. I would establish a United Nations agency, or let us say, an authority which might be more effective, that would coordinate the work of the specialized agencies. It would have, dealing with the problem of fisheries, quite a different problem from the problem of the resources of the seabed. Let us approach the fisheries for the moment.

The President's Marine Science Council in its first report said that as more fishermen participate in fisheries, the share of each diminishes, and it may be necessary to consider these problems more broadly and to initiate new forms of international cooperation and management for the high seas fisheries.

This is especially important as fishermen move to more scientific methods and have thus increased the threat to maintain sustainable yields.

So I would hope that the United Nations might, the authority might, like recognizing the fishing agreements that already are existing between nations, multilateral and bilateral, work out a system in which as President Johnson predicted, instead of being hunters in the sea we will be farmers in the sea. The program must eliminate waste and make it possible that there be more fish harvested and consequently more people able to partake of its protein resources.

As far as the bed of the sea is concerned, I would hope a system would be worked out by the United Nations and would license exploitation of the seabed on the basis of fully recognizing the options, the various plans of bidding that Mr. Christy has suggested. But somewhere there has to be an authority that will guarantee the exclusive right of each person, of each nation, to exploit. It should be some agency set up by the United Nations. Neither the United States, nor the Soviet Union, nor any particular country can do it and preserve its interests.

But I would set this agency up with the greatest efficiency in which American experts, scientists, and statesmen, and others would participate, and I gather it would take several years to work out.

Mr. Gross. I assume the United Nations, then, would finance the exploitation?

Mr. EICHELBERGER. I presume the United Nations would finance it from their licensing fees. The United Nations certainly would not do any exploiting. I certainly would not like to see them out mining this stuff and sinking oil wells.

Mr. Gross. I wondered how far you wanted to go.

Mr. EICHELBERGER. I would not have the United Nations own this stuff or exploit it.

Mr. Gross. That is helpful at least up to that point.

Unfortunately, I don't have a copy of your statement, but in your remarks you said something to the effect that the United Nations won't stand for, I take it, being ignored in this matter. Is this correct? What did you—

Mr. EICHELBERGER. No, sir; if I didn't make myself clear, I will try again.

I said that the underprivileged nations, there are some 80 out of 120-some states in the world, would not stand for an international law existing solely to safeguard the rights in the sea of those that are now in a position to go out and stake practically everything off. There was a time when international law was so drafted as to sanctify the colonial system, but I have seen that international law scrapped as the great colonial empires have gone, and I do not believe that an overwhelming part of the world would be satisfied with an international law that would give a few the right to stake off the seabed, as they have staked out colonies in days gone by.

Mr. GROSS. There was no intention of bringing the United Nations into this statement that they would not stand for—

Mr. EICHELBERGER. The United Nations is only an organization of its members. The United Nations is not a sovereign body that could object. It would be the members objecting through the United Nations.

Mr. GROSS. Of course, I don't think the United Nations stands for much of anything. It never has and probably never will, and that is one of the reasons why I don't want to see any authority in this matter vested in the United Nations, Mr. Eichelberger.

Mr. EICHELBERGER. Mr. Congressman, this is not a frivolous remark and I hope not an extraneous one. It was my privilege to speak to the Lutheran College in Waverly yesterday, I believe in your constituency. I spoke on the United Nations. I cannot think of anyone who has a happier constituency—

Mr. GROSS. Waverly, Iowa is a wonderful place and does an excellent job of supporting me.

Mr. EICHELBERGER. I know it has. You have been here a long time.

Mr. GROSS. I appreciate it.

Mr. DANZIG, you spoke of President Johnson's great concern. I was here when the offshore oil bill went through Congress. He was a Member of the U.S. Senate from Texas. I don't recall that he expressed the same kind of concern for the landlocked States of the United States when that bill went through.

I wonder if he has changed?

Mr. DANZIG. I am not in a position to answer your specific question, but the statement that I quoted was verbatim and it was made on July 13, 1966, so that in point of time it was substantially subsequent to the circumstances that you have described.

Mr. GROSS. Some of us, you know, thought we got a pretty raw deal in the offshore oil legislation, the resources—

Mr. DANZIG. Yes, I can see that that involves a complete complex question in itself and, in fact, even those States that are closer to the States have litigated the question. I see that *Louisiana v. United States* is back on the Supreme Court calendar and it involves just that issue, and I can understand how a State like Iowa, which incidentally is also a State where I have also lectured at the Iowa Law School, might be deeply concerned about something like that.

Mr. GROSS. They were not alone. There are other landlocked States which have no potential from the standpoint of the offshore resources of this country. We thought this might have been shared a little more handsomely. I am interested to know of the President's new-found concern for those foreigners who may someday participate in what we are discussing here today.

Mr. DANZIG. You make an interesting point.

Mr. GROSS. It was interesting during the discussion of the offshore oil bill on the House floor to learn of the 10-mile limit. I asked one of the Texas Representatives why Texas claimed 10 miles at sea. I suggested to him that they, at the time when Texas became a State, were interested in what was coming over the waters aside from catching fish. They were interested in what was coming over the water by way of an invading force, but they had no armament in those days capable of reaching out 10 miles over the sea.

His response to me was that I didn't know Texas; that they shot their cannon with the wind when they tried to reach out 10 miles. This was the explanation of the 10-mile limit off Texas.

Mr. DANZIG. I only learned the other day that this 3-mile limit was generated by the fact that at the time it was established, and I think this was something between Sweden and an adjacent country, this was the distance that a cannon could shoot a cannon ball at that time and that's how that limit got started.

Mr. GROSS. Yes, so in order to reach out 10 miles, they had to shoot them with the wind.

Mr. DANZIG. Yes, a Texas wind.

Mr. GROSS. A Texas wind. [Laughter.]

On a more serious side, Mr. Danzig, you spoke of the common heritage of the deep sea. What is the common heritage of the deep sea? Do we have a common heritage in outer space as well, and what is the application of a common heritage?

Mr. DANZIG. You ask a very telling question, a very intelligent one as well. It is easy to use phrases of that kind and when it comes to delineating them, it is not as easy. I suppose we could say that in the beginning the earth belonged to us all and that when God created it He didn't say it would belong to a specific man or a specific nation, and if we say that there is still five-sevenths of what God created which no man has yet taken to himself, or no nation, to that extent I mean that that five-sevenths is still the common heritage of mankind and should be so preserved.

Mr. GROSS. Thank you, Mr. Danzig, for your explanation.

Thank you, gentlemen, for your appearances this morning and thank you, Mr. Chairman.

Mr. FASCELL. Thank you, Mr. Gross.

Gentlemen, I am troubled by the apparent effort to fill a vacuum in international law because I am not sure that there is a vacuum. I keep coming back to this all the time. I may sound like a broken record, but it seems to me that Malta's effort may amount to an attempt to forestall a certain interpretation of the recent Convention on the Continental Shelf. It may really involve an attempt to keep the language of the convention from being interpreted in such a way that it would give to the coastal states jurisdictional rights, or operating rights, or territorial rights over the seas to where the depth of the superjacent waters admits of the exploration of natural resources.

It seems to me that here is the crux of the matter. That means that what is under consideration is a modification of some existing conventions. That, in turn, would seem to raise the question whether the coastal states had "the right" to do what they did, and whether their product is indeed international law.

Obviously, the nonsignatories to the convention could be out in the cold if the interpretation of this language were to be stretched along the lines I have mentioned.

That raises some other questions. For example, Mr. Christy, would you please explain what are these lines on that map? Where do they come from? Are they based on a concept contained in the Convention on the Continental Shelf?

Mr. CHRISTY. Yes, this is ignoring the principle of adjacency and ignoring the provision that the adjacent coastal states will negotiate

to arrive at a solution. This is based on the other principle upon which the lines will be divided and under which generally the North Sea has been divided, which is entirely the continental shelf except for a small trough off Norway. That is, every line is drawn so that every point on that line is equal in distance between the nearest point on the neighboring or opposing coastal states.

Mr. FASCELL. I understand that, but where does that underlying concept come from? Does it come from the language of the convention?

Mr. CHRISTY. That comes out of the language of the convention, but ignores, as I say, the principle of adjacency and, second, the negotiation aspects.

Mr. FASCELL. Is this an interpretation of the language of the convention or an actuality? I am not clear on this point. The reason I press this issue is that I have heard others talking about going out to the mid-Atlantic range or going to a midpoint of an ocean and I don't know where those concepts come from.

Are these lines suggested by the language of the convention? Could we find it and point it out in order to be specific?

Mr. DANZIG. Where the superjacent waters permit of exploitivty.

Mr. FASCELL. But that language does not refer to a midline?

Mr. DANZIG. No, it does not.

Mr. FASCELL. We don't know what "superjacent" means—above, beyond, contiguous, or what? We could go running through the dictionary for months.

Mr. CHRISTY. It says in article VI, "Where the same continental shelf is adjacent to the territories of two or more States whose coasts are opposite each other, the boundary of the continental shelf appertaining to such States shall be determined by agreement between them. In the absence of agreement between them, and unless another boundary line is justified by special circumstances, the boundary is the median line, every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured."

Mr. FASCELL. This doesn't seem to say anything about the deep-sea bed. A midline that crosses the continental shelf may be meaningless out over the deep sea. I don't see how you can talk about the continental shelves of some 100 countries and then jump to an area which obviously is not within the continental shelf.

Mr. CHRISTY. Let me say one thing, that this map and these lines are simply one illustration of one technique that might be used to divide up the sea floor. I thought I had expressed that. There are other ways in which it might be done.

Mr. FASCELL. That is what I was after. I just wanted to be sure that this map dividing up the sea—

Mr. CHRISTY. It is unofficial.

Mr. FASCELL. All right. I'm sorry I had so much trouble getting that through my head, but I wanted to be absolutely sure of what we are talking about.

Mr. DANZIG. I am very happy that you did, and I marvel at the way you addressed the total legal problem here, and I think you have correctly analyzed it. I think in the long run, not now, not at this hearing, not pursuant to any resolution that may be passed by the

General Assembly in which we will participate, but in the long run, Mr. Chairman, I think you have correctly analyzed it, that there will have to be a clarification of the definition of the continental shelf and those words that you uncovered on your own, which is that it goes to a depth of 200 meters and beyond that to where the superjacent waters permit of exploitation—that those words will have to be ultimately defined and I think that all those who have worked in this field recognize that in the long run this will have to be resolved, and I think you have correctly analyzed it.

Mr. FASCELL. Now, Mr. Danzig, the United States has gone beyond the 200-meter depth in issuing exploration leases, has it not? Didn't somebody testify to that effect?

Mr. DANZIG. Mr. Christy.

Mr. CHRISTY. Yes, it has.

Mr. FASCELL. How about other nations?

Mr. CHRISTY. I have a report that 15 nations have gone beyond these limits. The information comes from Prof. Louis Henkin's report to the Marine Science Council—

Mr. FASCELL. And you used this as one of the reasons for underlining the urgency of the problem?

Mr. CHRISTY. Yes, sir.

Mr. FASCELL. It seems to me also that we ought to put into the record something about the scope of what we are talking about here. For example, in a recent issue of *Oil and Gas Journal*, there is an article called "The North Sea Report." Without bothering to read the whole thing to you, I think that it may be useful to point out what happened there. The article says, and I quote:

Germany, Holland and Britain have long produced from scattered onshore fields, and imaginative geologists had no problem extending the same prospects into the North Sea. However, pay thickness, productivity, and reserves of the land fields were too small to make a high-cost offshore search worthwhile—until Holland's 40-trillion-cubic-foot Groningen gas field changed the outlook almost overnight.

After Groningen's size was realized in 1962, seismic boats started probing the North Sea. Several promising, large structures turned up. It was a good bet that conditions responsible for Groningen could exist offshore.

Bordering nations in 1964 divided the sea according to the Geneva Continental Shelf Convention, and a mad scramble was on.

The article goes on to point out what the potential reserves are, and there is a map included showing how the North Sea was divided. The location of all the existing wells is marked.

Now, is something comparable happening in other places?

Mr. EICHELBERGER. Just as a footnote, Mr. Chairman—

Mr. FASCELL. Let me just put this entire article in the record because it seems to cover the subject very well.

(The article follows:)

NORTH SEA REPORT

By Leslie C. Rogers, Drilling Editor

[From *Oil and Gas Journal*, Feb. 27, 1967]

Exploration men from London to Oslo heaved a sigh of relief 14 months ago when British Petroleum stamped the commercial label on its North Sea gas strike.

Until then, the industry had nothing to show for a brash, half-billion-dollar bet that it would find large reserves of oil or gas in the untested, 280,000-sq-mile body of water bounded by energy-hungry Britain, Holland, Germany, Denmark, and Norway.

Six more discoveries fast on the heels of BP's find removed any fears that the entire North Sea play might be a complete debacle. But jubilation gave way to new apprehension when Britain's Gas Council refused to offer producers what they felt was a fair price.

The U.K. marketing hassle, Holland's failure to adopt acceptable rules for opening its waters, and dismal drilling results off Germany tended to cloud the picture as drillers passed the halfway mark of their third winter in the hostile North Sea.

Geologists shine. Though not yet an economic success, the North Sea must be one of the most intriguing exploration successes of all time.

Germany, Holland, and Britain have long produced from scattered onshore fields, and imaginative geologists had no trouble extending the same prospects into the North Sea. However, pay thickness, productivity, and reserves of the land field were too small to make a high-cost offshore search worthwhile—until Holland's 40-trillion-cu-ft Groningen gas field changed the outlook almost overnight.

After Groningen's size was realized in 1962, seismic boats started probing the North Sea. Several promising, large structures turned up. It was a good bet that conditions responsible for Groningen could exist offshore.

Bordering nations in 1964 divided the sea according to the Geneva Continental-Shelf Convention, and a mad scramble was on. While Holland's Parliament dawdled, Britain—with the next-best prospects—promoted a highly competitive licensing arrangement that attracted 25 operating groups representing 66 companies. A 10-company combine won rights in Germany's federal waters. Denmark awarded its acreage to a single group composed of five-companies. Norway inked pacts with 9 operating combines made up of 18 firms.

Operators contracted for a hundred million dollars' worth of rigs and agreed to spend another quarter billion to explore their licenses—all before the bit had yielded one shred of evidence that the gamble would pay off. But the market was there; the prospects were there; and, if they could find gas deposits of sufficient size and could get a price competitive with other energy sources, the return would compensate for the risk.

German drillers hit a few pockets of mostly nitrogen gas and so far haven't got a whiff of salable methane. British prospectors punched down a string of dusters between 54° and 55° North latitude. Then in December 1965, a billowing flare atop British Petroleum's Sea Gem rig in U.K. Block 48/6 heralded the North Sea's first commercial strike. All told, the British North Sea has given up three definitely commercial gas fields, and four more strikes—one with a good show of oil—remain to be evaluated.

Five of the seven U.K. fields resemble Groningen in everything but size. Gas flows from the Permian Rotliegendes sand, which is covered with a cap rock of salt and lies between 7,000 and 10,000 ft. Pay thickness runs 500 ft. or more. Porosity and permeability compare favorably with Groningen. Well deliverabilities for the most part are everything operators had hoped for. Too, the gas contains a very small amount of nitrogen, whereas Groningen gas is about 15% nitrogen.

Arpet's Block 48/29 field produces from the Triassic Bunter sand at about 4,000 ft. Burmah's find in Block 48/22, which produced 4,000 bbl of oil along with gas in a 4-day test, produced from the Magnesian (Permian Zechstein) limestone at about 7,000 ft.

Reserves: 14 trillion. In British waters, an average of one wildcat in five has hit commercial gas. But lest anyone project this better-than-usual ratio into dreams of another Middle East or offshore Louisiana, exploration managers stress they are drilling best prospects first, and no single field uncovered to date begins to approach Groningen's reserves.

Shell-Esso's Block 49/26 field, for example, contains about 6 trillion cu ft. No other individual field estimates are available. However, the British Gas Council, monopoly buyer of all U.K. gas and an operating partner in the Amoco group, estimates total reserves at a minimum of 14 trillion cu ft. This figure will go much higher if Phillips' find in Block 49/6, two Amoco group discoveries in Blocks 49/18 and 49/23, and the Burmah strike eventually prove up.

Stepouts are not always successful because permeability can vary widely in a productive structure. Phillips, for instance, drilled a dry hole on a confirmation test south of its Block 49/6 discovery and canceled plans for a fixed drilling-production platform. Shell was shocked when its confirmation test in Block 49/26 turned out dry, but two later wells found the gas.

Development plans hatch. In high spirits, successful wildcatters mapped pipeline routes and picked development-platform sites. Based on just one well in Block 48/6, BP signed a Gas Council contract to deliver at least 50 MMcfd and a maximum of 100 MMcfd for 3 years at a price of 5 pence/therm, which works out to about 58 cents/Mcf. A new price must be negotiated after 3 years and for any deliveries above 100 MMcfd.

Under British licensing, about half of a North Sea producer's income from sales will go to the government in royalties and taxes. This is a common arrangement all around the sea. From the other half, the producer recovers exploration, pipeline, and exploitation costs. What's left is profit.

The government-owned Gas Council gets first call on all gas. If producers can convince the U.K. Minister of Power that the council has failed to offer a "reasonable" price, the minister can approve sales directly to industry.

A Gas Council price is for gas delivered ashore. Each producer must build and maintain an off-shore-pipeline system. BP laid 42 miles of 16-in. from Block 48/6 to the coast near Easington where the Gas Council connected the line to an existing grid which distributes imported Algerian gas throughout the island. Local gas boards use the methane to enrich town gas, which is manufactured from coal and consumed largely in kitchens for cooking.

Britain now burns 1 billion cfd of natural-gas equivalent in the form of coal gas, imported Algerian methane, and gas made from naphtha. According to the Gas Council, the landed price of BP's North Sea gas is slightly less than the landed price of Algerian gas, which had been Britain's cheapest gas source. Based on BP's experience, other producers had good reason to hope for around 5 pence/therm because this appeared competitive with other sources.

In the meantime, however, Gas Council officials had drawn up a 10-year plan to convert its entire town-gas network to natural gas and envisioned doubling or quadrupling sales through space heating and industrial applications. To take quick advantage of this new source of energy, the council said, North Sea gas might have to be priced at around 2½ pence/therm or about 29 cents/Mcf. Producers howled in dismay.

Minister of Power Richard Marsh observed that North Sea gas would be expected to help improve Britain's balance-of-payments problem by taking up some of the energy market that would otherwise be met by imported fuel. Besides Algerian gas, the U.K. imports 86,000 tons/day of oil. But, Marsh stressed, producers must get a price that will encourage continued, vigorous exploration. England's supply of North Sea gas, he added, is too small at present to make much of a dent in the overall energy pattern.

Marsh's view must prevail, producers insisted, if they are to press forward with exploration and development.

Eastern half barren. Meanwhile operators in the eastern part of the North Sea might welcome something to wrangle over. So far, waters of Norway, Denmark, and Germany are studded with nothing but dry holes or wells that produced non-commercial gas.

These three countries all have Permian prospects.

Also, the northern U.K. side is untouched but is believed to be a Tertiary basin with good prospects for oil.

The German consortium has run up a score of 11 worthless holes in as many tries. However, it will take much more drilling to condemn the whole area.

Drilling off Norway and Denmark got off to a slow start, and these two countries count only three holes between them with nothing significant reported.

Holland's Parliament has yet to present an acceptable plan for luring drillers into its promising off-shore sector. Nothing offered yet makes the risk attractive.

Risks run high: Throughout the North Sea, operators can point to some of the biggest expenses and some of the worst operating conditions they have ever encountered. Each hole costs about \$2 million.

Though year-round drilling has proved completely practical, waiting-on-weather time always eats up a few thousand dollars on each well. Most weather delays occur in moving rigs or in transporting men and supplies. The companies try to keep 3 weeks to a month of supplies on their rigs.

Forecast services do an admirable job, but North Sea weather changes so often and so quickly that meteorologists simply can't always keep abreast of developments.

Gales lash the sea all year. Vicious storms with hurricane-force winds are a constant threat in fall and winter, and, when they hit, rig crews have no time to do anything but ride them out. Fog, haze, almost constant cloud cover, and frequent showers add to the headaches.

Tides, which rise and fall 16-18 ft. in some places, sweep in and out each 6½ hr. Divers are restricted to about 2 hr. of slack tide per day. The tides give rise to currents—sometimes 2-4 knots—which often scour sand from around drilling-platform legs.

As expected, the cold in winter has not been too severe, and icing has not been a problem. Winter temperatures hover in the low to mid-thirties (Fahrenheit), while summer temperatures seldom get above 80° F.

Reverting records. Because the North Sea is so important to shipping, border nations have taken weather forecasting seriously and keep good records that go back several decades. From these records, oil companies developed an idea of the worst likely wind and sea conditions that would occur once a century. These data were the basis for initial designs of platforms and other installations.

The first well off England put the design criteria to a quick test. A 100-year storm struck the jackup Mr. Cap in early 1965 shortly after it moved to a Dogger Bank location for Amoseas. Storm waves ran about 10% higher than expected.

According to London Meteorological Office records, Mr. Cap's crew reported waves of 40 ft from trough to crest. And the U.K. National Institute of Oceanography estimated probably maximum waves were 45 ft high.

Operating trends. Despite storms and shipping hazards, British operators initially prefer fixed platforms for field development. After outlining their fields with jackup or semisubmersible rigs, they install large, multiwell structures to drill several directional exploitation wells. These platforms will be brightly lighted, equipped with far-reaching foghorns, and precisely charted on navigational maps.

Seven wells have been drilled with floating rigs and subsea-wellhead equipment, but these have been abandoned. No operator yet sees a compelling need to produce wells completed at the ocean floor. However, this view may change as drilling progresses northward in the next few years where water depths increase to 400-450 ft. in some licensed areas.

With jackup barges, most operators drill with caisson or mud-linewells can be temporarily abandoned at the ocean floor and reentered later for either an abovewater or underwater completion.

Rig fleet grows. If all goes well with British price talks, North Sea activity should surge ahead in coming months.

British Petroleum will have two development rigs running on fixed platforms in U.K. Block 48/6. Shell-Esso plan to install a rig and fixed platform to drill 10 development wells in U.K. Block 49/6 and will lay a 30-mile, 30-in. pipeline to shore.

Mobil Oil gets its first rig next month when North Sea Marine Engineering delivers the Norsmeck I jackup for drilling in British waters. Shell will start drilling off England with its Statof semisubmersible and hopes to take delivery this year on a semisubmersible and a jackup from Sea Drilling Netherlands, a new contract-drilling firm led by Southeastern Drilling.

Dansk Underground Consortium (DUC)—composed of A. P. Moller, Shell, Amoseas, and Gulf—will start drilling with its first full-time rig: a jackup owned by Zapata Off-Shore and built in the U.S.

Gulf Oil, operator for DUC, has ordered another jackup from a group of drillers headed by Rimrock Tidelands and will use the unit in British waters.

Ocean Drilling & Exploration's semisubmersible Ocean Viking, under contract to Phillips, joins ODECO's Ocean Explorer, working for Esso, in Norwegian waters. And Amoco plans to drill off Norway with a converted whaling vessel.

These new additions should fairly well take care of commitments for the time being—unless the Dutch finally get around to leasing their section of the North Sea. Oil companies believe the odds are 50-50 that Holland will act this year.

England's high success ratio plus the promise of important things to come in the Dutch "fairway" add up to a more than even chance that the North Sea could soon pass the threshold into the ranks of major producing areas. All the oil companies ask is fair treatment so they can get on with providing the answer.

Mr. EICHELBERGER. Germany is unhappy with the division she is receiving. She has a case before the World Court sometime next year asking for a larger share from the others.

Mr. FASCELL. While we are discussing this, what troubles me is how, even under the Convention, the coastal states could get together and carve up the North Sea and start licensing exploration.

Mr. EICHELBERGER. It was all continental shelf.

Mr. CHRISTY. In the North Sea it was all continental shelf except for a trough off of the coast of Norway, which goes below the 200-meter isobath, and in the agreement they reached it states they decided to ignore this trough and give Norway access to the rest of that shelf as if that trough did not exist.

In terms of the resources beyond, my remarks were limited almost entirely to the manganese nodules on the sea floor, which is generally, I believe, beyond the area where oil resources may occur.

And the question of urgency is not as great there at the moment except that I understand that an application for a lease is now before the Interior Department for rights to exploit the mineral resources of the sea floor off the Blake Plateau which is in waters of 3,000 feet, 40 or 50 miles off the coast of Florida.

This may be beyond the concept of incremental steps down the slope, it may be considered a jump out to deep water and how that is resolved, I don't know. This is the kind of situation that is cropping up on which some rule will have to be established.

Mr. FASCELL. Mr. Danzig?

Mr. DANZIG. Mr. Chairman, the article that you read from the Oil and Gas Journal addressed itself solely to an area, as Mr. Christy explained, that involved the Continental Shelf and there this midway doctrine or treaty among nations would apply.

Going back to your question of new developments—I don't know whether you observed in the New York Times about 2 months ago, and I would be glad to supply the committee with the article—there was a tremendous discovery made in the bed of the Red Sea beyond the continental shelf. It was estimated that the minimum value of the minerals discovered there was \$1.5 billion and the legal status of these minerals was undetermined.

Another very interesting advance in the field that I observed recently was the fact that the Newport News Shipbuilding and Docking Co. was granted a patent by the U.S. Patent Office. This appeared in the New York Times in late August of 1967. The patent was for a ship to mine manganese nodules in the ocean depth, so that this technology is proceeding at a very fast rate.

There are other authorities who feel that within the near future it will be possible to mine the manganese nodules which Mr. Christy has discussed.

Mr. FASCELL. Well, Mr. Danzig, the Treasury is not far behind the new technology. The Treasury has already ruled, I believe, that resources taken from the continental shelf are taken from the territory of the United States. What is that ruling; do you know?

Mr. CHRISTY. It is that resources beyond the continental shelf shall be subject to import duties when brought in.

Mr. FASCELL. Is that a Tariff Commission decision or a Treasury ruling, do you know? Maybe we can get that.

Mr. CHRISTY. That was in a letter that was attached to this map. I don't know if I brought a copy of that with me from the Treasury Department.

Mr. FASCELL. You could supply that later. Mr. Danzig, if you could get us that article that you mentioned, we would appreciate having it for our record.

Mr. DANZIG. I will be happy to supply the committee with both articles.

(Mr. Danzig subsequently provided the subcommittee with the following articles and related editorials:)

[From the New York Times, Aug. 6, 1967]

RICH MINERAL LODE FOUND IN RED SEA

(By John Nobel Wilford)

WOODS HOLE, Mass., Aug. 3.—A treasure of minerals, said to be the richest concentration of underwater ores ever found, has been discovered on the bottom of the Red Sea.

The value of the gold, silver, zinc and copper in one area alone is conservatively estimated at \$1.5-billion—a lode considered far greater than all the precious metal ore mined in the rich Ceur d'Alene region in Idaho since the eighteen-seventies. The estimates do not include the vast amounts of iron and manganese.

The discovery was made late last year by scientists from the Woods Hole (Mass.) Oceanographic Institution and is just now being reported in scientific circles.

Other such concentrated ore deposits are believed to exist under the oceans, Woods Hole oceanographers said today. They probably occur, as do the Red Sea deposits, along cracks that appear in the earth's crust like seams in a tennis ball. At these points, called rift valleys, heat and gases from the earth's interior are believed sometimes to boil to the surface.

The deposits were found at depths of about 7,000 feet in the Red Sea, about midway between the Arabian peninsula and the Sudan on the African continent. The nearest port is Jidda, which serves the sacred Moslem city of Mecca in Saudi Arabia.

Since the deposits are in a deep submarine valley off the continental shelves of both Africa and Arabia, it is not clear under whose jurisdiction they would fall.

SAMPLES FROM BOTTOM

The rich lode was identified from samples cored out of the bottom ooze by a team of scientists on board the Woods Hole research ship Chain. The ship, whose mission was supported by the National Science Foundation, spent six weeks last fall in the Red Sea.

"Man probably has never seen a more colorful sedimentary product emerge from the depths of the sea," reported Dr. E. T. Degens and Dr. D. A. Ross, Woods Hole geologists, in the current issue of the institution's journal *Oceanus*. "The color variation is fantastic; all shades of white, black, red, green, blue or yellow can be observed."

Woods Hole launched the expedition in an effort to answer questions that had been puzzling oceanographers for nearly a decade. What caused the basins of unusually hot and briny water in the Red Sea? What did they contain?

On previous expeditions, by British, German, Swedish and American oceanographers, three such basins on the sea floor had been pinpointed but not thoroughly investigated.

The largest of these "hot deeps," eight miles long and four miles wide, held pools of water about 650 feet deep with temperatures as high as 133 degrees Fahrenheit. Ordinary Red Sea water is a relatively cool 68 degrees. Water in the "deeps" is 10 times saltier than other sea water.

Scientists on the Chain concentrated on the largest "deep." They took its temperature, made electronic soundings of the bottom and took about 70 core samples. The residue from the dried ooze was about 90 per cent heavy metal oxides and sulphides, the most abundant of which were iron, manganese, zinc and copper.

CORES REACH 30 FEET

Although the cores reached only 30 feet, Woods Hole oceanographers reported that electronic soundings suggested that the thickness of the mineral beds extended more than 300 feet. Woods Hole plans an expedition in 1969 to make deeper and more widespread samplings.

Dr. John M. Hunt, chairman of the Woods Hole department of chemistry and geology and a chief scientist on the expedition, described the discovery in a recent interview as the "most concentrated ore deposit of underwater minerals that has been found to date anywhere."

Its estimated value of \$1.5-billion was arrived at by the United States Geological Survey and was based on only one of the three "deeps" and deposit thicknesses of only 30 feet. The survey estimated that the one basin held some 130 millions tons of copper, zinc, silver and gold.

However, according to Dr. Hunt, present methods of extracting minerals from the sea would probably prove too expensive, making immediate exploration of the deposits uneconomical compared with land operations.

ORIGIN UNEXPLAINED

Scientists are still left with the origin of such deposits and such hot-water basins unexplained.

The prevailing theory, Dr. Hunt said, is that the heat erupts periodically through cracks in the earth's crust. One of the main rifts runs the length of the Red Sea. The warm water, which would ordinarily rise to the surface, is trapped by its own unusually salty weight.

The high salt content presumably comes from submerged salt beds remaining from the ancient days when the Red Sea is believed to have evaporated to only a small fraction of its present size. This is generally associated with the Biblical account in Exodus of the sea becoming dry land after "Moses stretched out his hand over the sea."

The same submarine eruptions probably account for the high metal content, according to the Woods Hole scientists. When metals dissolved in the brine rise to the boundary of the normal waters, they apparently turn solid and fall to the sea bottom below and sink into the sediment.

[From the New York Times, Aug. 7, 1967]

RICHES OF THE SEA BED

Submarine colonialism is not yet a major international issue, but it could become one in the 1970's. The term refers to a possible race among nations to appropriate the sea bed—and the riches lying over and under it. The incentive for such appropriation becomes stronger with every advance in man's ability to live and work under the ocean's surface.

Illustrative of the treasures waiting to be tapped in the future is the rich concentration of gold, silver, zinc and copper ores recently found in just one area under the Red Sea at a depth of 7,000 feet. A very conservative estimate puts the value of ores in this deposit alone at about \$1.5 billion.

There is no reason to suppose that this find is unique. On the contrary, much evidence suggests that more mineral wealth lies under the seas and oceans than under the world's present area of dry land. It is now neither technically feasible nor profitable to attempt commercial mining operations under depths anything like that at which the Red Sea gold has been found. But in an era when men routinely send rockets to the moon, there can be little doubt but that mining the sea bed under 7,000 feet of water will some day be both possible and economical. If that were true today the Red Sea states would almost certainly be arguing over ownership of this sea bed.

An attractive proposal to avoid such quarrels was suggested at the recent World Peace Through Law conference in Geneva. The more than 2,000 lawyers who met there urged the United Nations General Assembly to assume "jurisdiction and control" over the huge mineral resources in the oceans and under them. Such a move would ultimately make it possible for the United Nations to have its own independent income and to use for the benefit of all men and all nations riches that now belong to nobody and benefit nobody. And such a resolution of the issue would forever prevent submarine colonialism from threatening the world's peace.

[From the New York Times, Aug. 5, 1967]

PATENTS OF THE WEEK—UNDERWATER MINING SHIP IS DEVISED

(By Stacy V. Jones)

WASHINGTON, Aug. 4.—Shipbuilders have designed a vessel to harvest potato-shaped lumps from the ocean floor. The lumps are regarded as a rich potential source of manganese.

The underwater mining ship was patented this week for the Newport News Shipbuilding and Dry Dock Company of Newport News, Va., builders of many major naval vessels as well as the superliner United States.

Manganese is an essential element in steelmaking, and only about one per cent of its needs is produced in this country. The lumps, or nodules, have been reported at hundreds of locations, chiefly in the Pacific, but also in the Atlantic.

Patent 3,333,562 refers to the possibility of commercial mining at depths from 400 to 12,000 feet or more.

The company has conducted ocean-mining studies over several years. Beyond indicating that the mining ship described in the patent had not been built, a spokesman declined to discuss plans for the project.

The procedure indicated in the patent begins with raking the ocean floor, and metering the collected ore and water into an intake pipe.

Pumped up into the ship, the nodules are to be moved by screw conveyors into hoppers for storage.

Besides the mining ship, the plan includes a cargo vessel to be towed about 600 feet astern, with a floating conduit through which the nodules can be transferred to it.

The mining equipment is to be lowered through a rectangular central well in the main ship, and to be moved with the aid of a dolly, an elevator and an overhead crane.

The expected speed between port and mining site is 14 knots. During mining operations, the ship is to be maneuverable on a steady course at less than five knots, with a bow thruster to supplement the rudder and counter the effects of wind and sea. Personnel can be transferred by helicopter.

The inventors are John E. Flipse, director of research and forward planning, and four other engineers: Joseph D. Deal Jr., Nicholas E. Oresko, John L. Stevens Jr. and Robert M. Donaldson.

In a 1963 operation reported by the Bureau of Mines, a ton of nodules was gathered off Baja California, Mexico, at depths up to 12,500 feet. They were from one to four inches in diameter, from flat to spherical in shape, and besides manganese contained iron, copper, nickel and cobalt. The cost of refining the metal is yet to be determined.

[From the New York Times, Sept. 23, 1967]

BATTLE FOR THE SEA BED

Battle has now been joined this month both at the United Nations and in Congress over the last part of the earth's surface still free of national appropriation: the sea bed beyond the continental shelf. The only entirely new item on the General Assembly agenda is Malta's proposal for the internationalization of this vast area, while in Congress bills have been introduced to establish American opposition to any move to give the U.N. ownership of the potential riches on and beneath the ocean floor.

Those who have so hurriedly raised this issue in Congress were apparently hoping to persuade the Johnson Administration not to support Malta's proposal or any variant of it. Ambassador Goldberg's friendly reaction to that suggestion, however, frustrated the opponents' initial goal; but the fighting on this issue has only begun.

Ambassador Goldberg put the whole issue in proper perspective by comparing the ocean floor with outer space. Both regions of the universe were until recently totally inaccessible to purposeful human activity, but rapid technological advance is changing that situation radically in both cases.

Since neither the United States nor any other nation owns either the planets or the ocean floor, there can be no question of any "give away" if the decision is

made to internationalize the resources involved and to reserve them for the future benefit of mankind. The real threat in both cases is that technological advance will bring with it national rivalry and the threat of conflict because of competitive efforts to appropriate these formerly inaccessible resources.

In space, that specter has been lifted by the recent treaty forbidding national appropriation of any heavenly body. The case for similar internationalization of "inner space," the sea bed, is equally valid.

Mr. FASCELL. The Treasury ruling that ocean bottom resources are within the jurisdiction or sovereignty of the United States raises a real question, if we get to the point that Mr. Christy was making earlier regarding the language of the Convention.

Mr. DANZIG. Mr. Chairman, isn't the implication of that rule, which I regret I have not had an opportunity to see, but relying on your summary of it, the implication of that ruling is that if profits derived from mining operations outside of the continental shelf would be taxed as an import, then those areas would be deemed outside of the jurisdiction of the United States and consistent with an interpretation that they are not subject to our sovereignty.

Mr. FASCELL. That is an interesting point. It would seem to me that it raises a question whether one agency of this Government has already placed an interpretation on the language of the Convention which may extend beyond the intent of the signers of the Convention.

It would be interesting for us to determine sometime in the future, whether the signers of the Convention intended sovereignty—or simply exploitation rights—to be conferred by that document.

Mr. CHRISTY. May I quote from a paper given by former Under Secretary Charles Luce at the American Bar Association National Institute on Marine Resources, in which he says:

And the United States has taken action consistent with a claim of sovereign rights to the sea bed and subfloor some distance from its coasts, by the granting of a phosphate lease some 40 miles from the California coast in the Forty-Mile Bank area in 240 to 4,000 feet of water; by the granting of oil and gas leases some 30 miles off of the Oregon coast in about 1500 feet of water; and in the threatened litigation against the creation of a new island by private parties on the Cortez Bank, about 50 miles from the San Clemente Island off the coast of California, or about 100 miles from the mainland. Each of the California areas is separated from the coast by troughs as much as 4,000 to 5,000 feet deep. The Department of the Interior has published OCS leasing maps indicating an intent to assume jurisdiction over the ocean bottom as far as 100 miles off the Southern California coast in water depths as great as 6,000 feet.¹

Mr. FASCELL. That interpretation seems to be in direct contravention to the Treasury Department decision. Since we discussed that earlier, we might as well put the letter in at this point. It is dated May 18, 1967, from the Director of the Division of Tariff Classification Rulings and is addressed to United Aircraft Research Laboratories.

(The letter referred to follows:)

TREASURY DEPARTMENT.
BUREAU OF CUSTOMS,
Washington, May 18, 1967.

Mr. J. LESLIE GOODIER,
*Senior Research Engineer, United Aircraft Research Laboratories,
United Aircraft Corp., East Hartford, Conn.*

DEAR MR. GOODIER: Your letter of April 24, 1967, inquires as to whether products mined from the ocean floor are subject to the duties imposed on the importation of merchandise imported into the United States.

¹ For complete text of address, see appendix p. 231.

Section 4(a) of the Outer Continental Shelf Lands Act (43 U.S.C. 1333(a)) provides as follows:

"The constitution and laws and civil and political jurisdiction are extended to the subsoil and all seabed of the outer continental shelf and to all artificial islands and fixed structures which may be erected thereon for the purpose of exploring, developing, removing, and transporting resources therefrom to the same extent as if the outer continental shelf were an area of exclusive federal jurisdiction located within a State: * * *"

In accordance with this provision, minerals obtained from the seabed of the Continental Shelf are taken from territory of the United States and are therefore not imported merchandise. Conversely mined products or other articles obtained from the ocean or from the bottom thereof beyond the Continental Shelf, if brought into the United States, must be considered as imported and are subject to such customs duties which may be applicable under the Tariff Schedules of the United States.

Sincerely yours,

E. F. KILPATRICK,

Director, Division of Tariff Classification Rulings.

Mr. DANZIG. Mr. Chairman, the lawyer in me prompts me to reconcile these two decisions.

Mr. FASCELL. That instinct makes for the best kind of lawyer.

Mr. DANZIG. Which is, that the Department of the Interior is simply in its mind defining the continental shelf, which incidentally as we have seen, is a somewhat complicated question, and that the Treasury Department is saying, well, accepting that definition, whatever you mine outside of the shelf is an imported item.

Mr. FASCELL. Yes; and the lawyer in me, Mr. Danzig, compels me to state that if I were a prospective lessee, I would, in view of the Treasury Department's ruling, get Interior to issue me a lease on the continental shelf even if it was 500 miles out into the sea, then I would not have to pay any import duty.

Maybe it is the businessman in me rather than a lawyer—I don't know which.

Mr. DANZIG. It sounds like a good lawyer and businessman.

Mr. FASCELL. In any event, all this serves to point out the necessity for an intelligent study of the problem and some sensible resolution of the apparent conflicts, both insofar as the United States and the entire international community are concerned.

Now, it seems to me that I need to emphasize what has been expressed by the many resolutions which are pending before this subcommittee. It is the desire not to see the United States thwarted in any of its rights or its opportunities, or any U.S. business interests eliminated from access to potential resources, by some action in the United Nations.

It seems to me that the first step has already been taken in this matter. The title of the proposal by Malta has been modified so that the agenda item now does not refer to either a declaration or a treaty. Is that correct?

Mr. EICHELBERGER. That is correct. However, that does not prevent any nation from introducing a resolution in the General Assembly and I shall imagine there shall be quite a number of resolutions introduced in the General Assembly. They might go so far as to call for a committee to draft a treaty. I think many of them look to the pattern of the Assembly in 1961, that outer space and celestial bodies were not subject to appropriation or annexation. A treaty is being signed this noon.

If I may express my hope that this Assembly would follow the prece-

edent of 1961 and declare the bed of the sea and the waters beyond the territorial waters—they have to be defined more clearly—are not subject to appropriation by any state, to stop a rash of claims and leases, that may plunge us into a power struggle before we realize it. Then the General Assembly should establish a committee, in which the United States would play a prominent part, to see if a rational order could not be worked out.

Much of my life I have wrestled with the problem of the self-interest of one's country and the common interest of mankind. I believe most of the time the common interest of mankind coincides with the self-interest of our country. When you think of self-interest only, you may be defeating yourself in the long run. Those who say, let's exploit as much of the sea bed as we can before the Russians come along, I think, are harmful to the common interests of this country.

I believe we will have greater protection for our entrepreneurs on the seabed, and there will be greater benefits for all mankind if a rational international order can be worked out.

I want the nations to move quickly to establish the broad principles, and then with deliberation work out in the most practical way the agency to implement them.

Mr. FASCELL. Thank you, Mr. Eichelberger.

Mr. Danzig, would you like to make some concluding remarks?

Mr. DANZIG. Yes, I just want to say that I think what Malta is seeking before the General Assembly is exactly what Clark Eichelberger has stated. I think it would be misleading to say that the amendment of their proposal means that they are not going to seek a resolution. They are not going to seek a treaty at this session; but I think that they are going to seek a resolution that the seabed is not subject to national appropriation, and I think that Mr. Eichelberger has so beautifully summed up my own philosophy in this field, that it does not require further elaboration.

Mr. FASCELL. Mr. Christy?

Mr. CHRISTY. No thank you, Mr. Chairman.

Mr. FASCELL. Gentlemen, let me thank all of you once again for making a very important contribution to our study of this very difficult subject.

The subcommittee is adjourned subject to the call of the Chair.

(Whereupon, at 11:30 a.m. the subcommittee adjourned, to reconvene at the call of the Chair.)

THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

THURSDAY, OCTOBER 19, 1967

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATION AND MOVEMENTS,
Washington, D.C.

The Subcommittee on International Organizations and Movements met, pursuant to recess, at 10 a.m., in room 2200, Rayburn House Office Building, Hon. Dante B. Fascell (chairman of the subcommittee) presiding.

Mr. FASCELL. The subcommittee will please come to order.

We meet this morning to continue our hearings on several resolutions referred to this subcommittee, relating to the question of jurisdiction over the resources located on the ocean floor.

In the course of our earlier hearings, our subcommittee received testimony from Members of Congress who sponsored resolutions expressing opposition to the vesting in the United Nations of the title to those resources.

We next heard from a Department of State spokesman, who outlined the position of the executive branch on this subject.

Subsequently, the subcommittee took testimony from several private witnesses who generally urged that some sort of international supervision be established over the exploration of the deep sea resources to forestall possible conflicts between nations interested in such exploration.

Today we are going to get away from the policy issues involved in this question in order to gain some better understanding of the nature, and the extent, of the resources which lie on the bottom on the seas.

To enlighten us on this topic, we have invited two expert witnesses:

Dr. Harold James, the Chief Geologist of U.S. Geological Survey, who is no mean expert in his own right.

Mr. Willard Bascom, president of Ocean Science and Engineering, Inc., also a renowned authority on ocean resources, whom *Life Magazine* called the Trailbreaker of the Deeps, and who pioneered Project Mohole.

If there is no objection, I should like to put into the record brief biographical sketches of our witnesses, prepared by the staff.

(Biographical sketches follow:)

DR. HAROLD JAMES

Chief Geologist, U.S. Geological Survey. Born June 11, 1912 in British Columbia. Received BS Degree from Washington State University, 1938; Ph.D from Princeton, 1945; has served with the United States Geological Survey

periodically from 1938 until the present; instructor in geology at University of Washington, 1949-40; instructor in mineralogy at Princeton, 1941; visiting professor at Northwestern University 1952-53; professor at University of Minnesota, 1960-64; appointed Chief Geologist of U.S. Geological Survey in November 1965. Author of numerous papers relating to studies of iron ore deposits of Lake Superior; studies of iron and other deposits of the Northern Rockies. Member of National Academy of Sciences since 1962; Council of Geological Society of America 1956-60; Council of Society of Economic Geologists, 1958-60; Council of Mineralogical Society, 1962-66; and President of Peninsula Geological Society in 1959.

WILLARD BASCOM

President of Ocean Science and Engineering, Inc. Born 1916 in New York City. Attended Colorado School of Mines. After working as a miner and engineer he began his study of beaches as a research-engineer for the Waves Project at the University of California, first at Berkeley and then Scripps Institution of Oceanography. In 1953 he sailed as chief scientist on Oceanographic expedition "Capricorn" through the tropical Pacific. Next joined staff of National Academy of Sciences, organizing committees on amphibious operations, civil defense, meteorology, oceanography, and maritime research. Served as a special consultant to the Rockefeller Brothers Special Study Group; as a member of Project Nobska, which conceived the POLARIS missile; and as a U.S. delegate to the International Geophysical Year conferences on oceanography and atmospheric radioactivity; as science consultant to the CBS "Conquest" TV series; as a member of the Atomic Energy Commission "Plowshare Committee" and AAAS Committee on Public Understanding of Science; and as UN-designated delegate to the International Geophysical Congress in Moscow, 1966. He is perhaps best known for his work in organizing the MOHOLE Project for the National Academy of Sciences. Author of *A Hole in the Bottom of the Sea* and numerous articles, pamphlets and books including "Shoreline Atlas of the Pacific Coast of the U.S."; "Experimental Drilling in Deep Water", and "Design of a Deep Ocean Drilling Ship". Lecturer here and in Europe on oceanography. Subject of LIFE Magazine story of September 30, 1966 entitled, "Trailbreaker of the Deeps."

Mr. FASCELL. We want to welcome both of you gentlemen, and to thank you for agreeing to meet with our subcommittee on what was a rather short notice.

The witnesses before us this morning are not here to take positions, as individuals or as representatives of their respective organizations, on the resolutions before us.

They are here simply to enlarge our knowledge of the resources that are the subject of the resolutions—the minerals which rest on the ocean floor. They are here to tell us what those resources are, how man can get at them, and what are some of the possible developments in the technology of extracting those resources.

In accordance with our usual procedure, we will ask each of the witnesses to make a brief opening statement—of approximately 10 minutes' duration—after which the subcommittee will have an opportunity to question the witnesses.

We had hoped to see a film on this interesting subject if our meeting ended early enough. However, late last evening we were advised that the executive branch wants to share some information with the subcommittee in executive session. We will therefore postpone seeing the film, try to end the open hearing by 11:30 at the latest, and then go into an executive session.

At this point, we will call on Dr. James who will brief us in connection with the mineral wealth in and on the bottom of the sea. Mr. Bascom will then fill us in on the technology of exploring for, and exploiting, those resources.

Doctor James.

STATEMENT OF DR. HAROLD L. JAMES, CHIEF GEOLOGIST, U.S.
GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

Dr. JAMES. Thank you, Mr. Chairman.

First of all, I would like to introduce the man accompanying me, Mr. Thomas Howard.

Mr. FASCELL. Mr. Howard, why don't you join Dr. James at the table?

Dr. JAMES. Mr. Howard is Director of Mining Research in the Bureau of Mines. He will be here to help answer any questions on the technology of mining.

In discussing this matter of the mineral potential of the oceans, it seems rather convenient to divide it up into the continental shelves and slopes, and into the deep ocean basins.

I am sure you are well aware that it is very difficult to make any precise definition of what these units are in terms that stand up legally or in terms of depth of water. The separation is somewhat easier, geologically.

The continental shelf and slope is part of the continent. The rocks that are exposed on the continent continue out under the shelves and on out onto the slope. The continental area therefore consists of the continent as we now see it and the shelf and the slope in addition. The area of the United States is something in the neighborhood of 3,600,000 square miles. If we add the area of the shelf and the slope to this we add about 1,300,000 square miles to it.

So the shelf and the slope we are talking about is an area about a third the size of the United States. It is a very large area.

The position of the shoreline at present is purely accidental. It has been very much inland at times in the past. It has been very much out at sea in times past.

Just to illustrate this, I would like to show you a couple of illustrations here of the Bering Sea. We are doing quite a lot of work with the Bureau of Mines in the Bering Sea at the present time—this region out here. We are studying the area for the possibility of gold placers.

These red lines represent the old shorelines, the old beach strands Russia. Here is a part of the Bering Sea adjoining our coast of Alaska. Here is the famous Yukon River, Nome. Here is the closest part of Russia.

These red lines represent the old shorelines, the old beach strands at different times.

Here is one which is at depths now of 400 feet.

These blue dashed lines represent the course of old stream channels across the Bering Sea. This area has been dry land at time within the last 100,000 years. It is across this dry land that the pre-Indian groups came to North America. So this is really part of the continent. The fact that it is covered with water, at the present time, is rather accidental.

We are studying these areas just as we would areas on land.

In rather similar fashion, we could look at the east and gulf coasts of the United States. This inside red line represents the inner side of what we call the coastal plain sediments. The outer line is the 200

meter contour. This could well be the margin of the country at any given time. Ten thousands years ago the coast line of the country was in fact out here. The mineral value of the submerged shelf is very much comparable to that of the land adjacent to it.

The land inside the shore—that is, on the landward side—has already yielded about \$80 billion of mineral products. So far the land offshore has yielded about \$7 billion. We can make an estimate, then, of the mineral potential of the shelf and slope by comparing it with the adjoining land areas.

I said the area of the county is around 3,600,000 square miles. We produce—in the United States—about \$20 billion worth of mineral products annually. This gives us a production of something in the neighborhood of \$5,500 per square mile per year in the Continental United States. If we took that same figure and applied it to the 1,300,000 square miles of the continental shelf, it would mean that we have a potential production from the continental shelves of the United States of about seven and a half billion dollars a year.

At the present time, we produce about \$1.3 billion a year from the continental shelf and slope. So it means at the present time we are only realizing about one-sixth the potential of the continental shelves.

The principal mineral commodities that we take from the Continental Shelf and slope are oil, gas, and sulfur. These are recovered from drill holes rather than by actual underground mining, and it is perfectly feasible to extract from depths of the water of several hundred feet.

The only other mineral commodities that we take from the shelf and slope are prosaic things such as sand and gravel for construction and shells for concrete.

Elsewhere in the world there is a very substantial production of diamonds, tin, gold, and some other materials, from the marine realm. But most of this is from depths that are not in excess of a few hundred feet.

We do, then, have a very large mineral potential which we can be fairly sure of and can appraise fairly well on the continental shelf and slopes. Just to give some idea of the areas that I am speaking of, we are assuming the shelf in general goes out to about 200 meters in depth, the slope out to perhaps 2,000 meters in depth.

The oceanic depths, the areas beyond the continental slope, in general will be at depths greater than 5,000 feet. These are areas of intense interest to those of us who are engaged in the study of mineral resources. In actual fact we know very little about it. That is perhaps one of the reasons why we are so interested in them. This is a wholly different kind of terrain. It is one that we are not familiar with in our work on the continents.

There may well be—in this oceanic area—wholly different kinds of mineral deposits, types we know nothing about at the present time.

At the present time, we are in a period of perfectly fantastic developments of concepts of the geology of the oceanic basins. The geology of the oceanic basin is incredibly different than that of the continent. We expect the mineral deposits—if there are any there—will turn out to be quite different, too.

We know quite a little bit about a few things in the deep ocean, the well-publicized manganese nodules, for example. These represent a

tremendous concentration of manganese and other elements, too, on the sea floor. I must say it is very easy to get caught up in our own arithmetic and arrive at very impressive and sometimes rather misleading values. At the present time, even if you could gather these nodules up very cheaply, I doubt if you could give them away to anyone in the mineral processing industry. The values are there but the cost of extracting them is greater than the values at the present time.

I think that these manganese nodules will be one of the real resources of the future, but at the present time they are just something that is potential. They are not now economic.

The question has been raised many times as to the possibilities of oil and gas in the deep ocean. We can't answer this question at the present time. It will require a great deal more bottom exploration and drilling before we can even get a hint as to what the real potential is. I suspect that there are real possibilities, and I think one would be very foolish to discount them.

Some of the areas are of very considerable interest: the so-called continental rise—particularly in the central and northern part of the Atlantic where the deep oceanic basins below depths of, say, 13,000 feet, gradually slope up to the base of the continental slope, at 5,000 or 6,000 feet. This is an area of very thick sediments which contain a great deal of organic material and it is entirely possible that a potential exists here for oil and gas.

Just this quick once-over, and in summary I would say that we know quite a bit about the mineral potential of the continental margins of the United States, which amount to one-third the area of the Continental United States. We know quite a bit about this continental shelf and slope and we can make a fair guess to the mineral potential.

We know virtually nothing about the mineral potentials of the deep ocean basins, which cover an area about twice as large as all the continents put together.

Mr. FASCELL. Thank you very much, Dr. James.

We will now hear from Mr. Bascom so that we can have all the testimony before us before we begin questioning.

I would like at the outset, if I may, to include an article, "Mining the Ocean Depths," by Mr. Willard Bascom, which appeared in *Geoscience News*.

(The article follows:)

MINING THE OCEAN DEPTHS

(By Dr. Willard Bascom)

The idea of prospecting for minerals beneath the sea is not new. For many years dredges have mined for tin in the protected waters of Thailand and Indonesia. Pumps have brought up sands and gravels for building materials from marine deposits off England. Gold miners in Alaska and coal miners in Japan have followed underground veins and seams well out under the sea.

Huge industries are concerned with the offshore production of oil, gas, and sulphur from great depths in the rocks below the sea. Still others deal with the extraction of minerals from sea water by chemical processes. But undersea prospecting for minerals on the sea floor in the form described herein—beneath rough salt water in exposed ocean areas—is a recent development, less than a decade old.

This new form of industrial science has its own special requirements for geophysical equipment and sampling tools. Because each climatic area, each

depth of water, each mineral site and each type of sediment or bedrock exerts an influence on the prospecting method, the undersea mineral hunter must have a variety of instruments and techniques at his command. After careful thought for each locality, he selects the equipment which can be most effectively employed at the least cost.

Small amounts of potentially valuable minerals such as phosphorite, rutile, cassiterite, ilmenite, zircon—even platinum and gold—can be found undersea in many places. But the objective of undersea mining is to recover products which must be sold at prices controlled by world demand. Thus, the prospector is more likely to be the representative of a mining company interested in developing undersea wealth than a curious scientist whose product is a technical paper. He is concerned with finding mineral deposits of sufficient size and concentration to be of economic significance. *To this moment* (as far as the author knows) *there has never been a profitable mining operation in an oceanic offshore area.* This inhibits mining companies who are otherwise interested in exploring the sea floor.

Methods of exploration will be discussed presently, but these must be selected in accordance with the geological situation and the probable mining conditions. Ideas about what minerals to look for and where to look for them are important because sound concepts of economics, geology, and engineering can greatly reduce the areas in which it is worthwhile for a prospector to search. Obviously, it would be a hopeless task to look for all minerals everywhere beneath the sea. The undersea prospector must have logical reasons why valuable minerals may be present and some feasible method in mind for recovering them.

There are several general classes of possible ore deposits: (1) placer deposits, (2) chemical precipitates, and (3) vein or bedded deposits. Each of these poses an entirely different prospecting problem. The interest to date has mainly been in the first two categories where the geological method has been generally to examine the sea bottom offshore near known placers onshore, or to sample deeper waters with a simple chain dredge in areas where nodules have been found by scientific investigators.

There are several water-depth zones, each of which is prospected in a different fashion and with a special point of view less than 8 meters; 8 to 50 meters; 50 to 500 meters and the continental slope and deep ocean basins. The depth segregation derives from the following circumstances. Less than eight meters on an open coast includes the surf zone—an area of breaking waves with turbulent water and longshore currents—in which prospecting is very difficult. This area of oceanic violence is from 100 to 1,000 meters wide and, except on very calm days, is dangerous for all ships and dredges.

The depth zone between 8 and 50 meters is the most conveniently mineable at this stage of development of our new industry. However, no existing production mining dredge reaches to a depth greater than 50 meters, even in calm water. This is a critical depth for placer type operations because deeper digging in rough water will require major machinery developments. The depths from fifty to 500 meters comprise all the remaining areas of the continental shelves and the upper reaches of the continental slope—which includes most of the likely phosphorite deposits. These surface nodule deposits can probably be skimmed by fairly simple machinery with comparatively little development—although this has not yet been done. Beyond the 500 meter depth are the slope and basin deposits—mostly very fine grained sediment with some nodular precipitates.

Most mining companies considering these depth zones, and the minerals likely to be available, will decide to concentrate on the depths between eight and fifty meters. The very shallow, violent surf zone (on exposed coasts) and the deep ocean basins probably will continue to be expensive to prospect and mine.

COST—A FACTOR

Of course, it is generally acknowledged that with today's technology it is possible to invent a system or a machine that will perform nearly any task, but usually not at an acceptable cost if the product produced must compete in the world market. This is a compelling reason to search areas which could be mined soon with minimal development.

If the prospector is going to search for placer deposits—heavy mineral grains in sands and gravels—he begins by considering the geological evidence that is conveniently available. Obviously one of the first places to look beneath the sea is adjacent to onshore areas where successful placer mining has been done. This may be offshore of a beach or river where valuable minerals were mined

a hundred or more years ago. Areas adjacent to a hard-rock mining district or to mineralized source rocks subjected to long erosion may be promising.

The prospector looks for steep stream gradients between the mineralized area and the sea which could have transported the minerals. It would be unlikely to find undersea placers if a wide floodplain with meandering streams intervened.

Large waves (at least occasionally) and strong coastal currents do an important job of concentration. The offshore miner does not want to have to sort through *all* the material brought down by a river any more than the onshore miner would mine a whole mountain to get a single vein. Luckily, the most valuable minerals have relatively high densities. Thus, when the sediment discharged by the river is stirred up by the waves and the light material is carried away by the currents, there is a natural concentration of heavy minerals adjacent to bedrock.

The highest concentration of heavy minerals is likely to be beneath the beach. (Note that a beach is defined as rocky fragmental material that moves when subjected to ordinary wave action. This includes the sands and gravels that lie beneath the surf as well as those visible above water.) However, ancient Pleistocene beach lines can be found at several depths below present sea level where they form sort of mineralized wind-rows of sand and gravel. Other undersea features that may have been formed at the same time by wave action are seacliffs, lines of gulleys perpendicular to the shoreline, and wave-cut benches. Much of the geophysical work is directed towards finding and mapping these features.

NON-GEOLOGICAL PROBLEMS

An undersea prospecting program is influenced by many other non-geological factors which are of critical importance in deciding what minerals to look for and where to look. Among these are bad weather conditions which are not as serious a bar to prospecting as they are to long term mining operations. Occasional violent storms, high winds, or a short ice-free season will increase risks and costs to such an extent that the grade of ore required for profitable mining will be several times that of warm calm seas. This greatly alters the prospector's cutoff grade and affects his methods.

Another consideration is the matter of obtaining clear title to the mineral lands to be prospected. This has not been much of a problem to date because most placer deposits are in nearshore areas subject to the control of the adjacent country. But there are unclaimed oceanic banks and vast areas of deep water where chemical precipitate deposits might be mined and where title is uncertain.

The undersea mining prospector needs specialized equipment that is precisely suited to his unusual task. He uses geophysical equipment to determine the shape, structure, and mineral constituents of the sea floor. Of these, the configuration and contour of the bottom is the easiest to discover. Recording echo sounders of a wide range of frequencies (from 10 to 300 kc) are inexpensive, portable, and easily available. Since the higher frequencies are attenuated by seawater, work beyond the edge of the continental shelf usually is done with 10 or 12 kc instruments. Often an experienced marine geologist can determine the position of old shorelines, areas of exposed bedrock, seacliffs, and other important features simply by using the hydrographic charts made from an echo sounder record.

In some circumstances a recording magnetometer towed behind the ship can be useful—the proton-precession variety is the simplest and most convenient form. It is used to map gross magnetic anomalies such as the abrupt change between granite and limestone. Contact metamorphic deposits or tin deposits associated with the granite may be found in this manner. Presumably it can also be used to determine directly the extent of magnetic mineral deposits (magnetite or ilmenite)—either for their own sake or because they are associated with more valuable materials.

A scintillometer properly encased, can be dragged along the sea floor to determine whether or not radioactive minerals are present in situ or as sand (monazite, for example).

But the mainstay of mining geophysics is the continuous sonic profiler. In effect it is a high-powered low-frequency echo sounder capable of penetrating the unconsolidated material of the sea floor and reflecting from the bedrock beneath. The purpose is to determine the depth and shape of the bedrock, and the fine structure within the unconsolidated sediment. Occasionally the near-surface bedding structure in the bedrock itself is useful, especially if its dip is sufficient to influence the movement of the mineral bearing unconsolidated material. The

techniques used are quite different from those used in searching for undersea oil structures where penetration of a thousand meters or more is required. Rarely does this kind of mineral work require sediment penetrations of more than twenty meters.

MAPPING SHALLOW BEDS

In trying to design an instrument to map shallow beds beneath shallow water there are several problems. As always in sonic work, there must be a compromise between the high frequency required for good definition and the low frequency required for penetration—the possibilities ranging from about 0.5 kc to 5.0 kc. Generally the higher frequencies will penetrate 5 to 10 meters of very fine sand but the lower part of the frequency range is required if gravel and cobbles or thick sediment is likely to be encountered. The wave length of the sound should be at least ten times the diameter of the individual stones. In shallow water it is necessary to have a very short duration pulse; otherwise the outgoing signal will mask the returning reflections. Moreover, in shallow water there usually are reverberations when the outgoing signal bounces back and forth between seafloor and sea surface. These surface multiples may obscure direct reflections from the deeper strata.

It is usually best to tow the sound generating and receiving instruments in a submerged "fish" well astern of the geophysical ship. This reduces ship noise and surface noise. The use of air-backed downward-looking reflectors in the fish above the instruments greatly reduces the initial surface reverberation and improves the record quality.

Experience has shown that a frequency of about one kc with a very steep half-wave sound pulse is generally effective and gives acceptable definition. Although the apparent uncertainty at one kc is about one meter, in practice if all the records are measured against the same datum, the error is much less.

One can never be certain that sonic methods will be effective in an untried area. On one occasion our geophysicists encountered a very rough coral bottom beneath shallow sand which gave no coherent reflection. Another time, gaseous muds in one sub-bottom layer looked like a faulted hard strata on the record and masked all beds beneath. However, in especially favorable circumstances it has been possible to detect mid-sediment details of such things as old beach facies and layers of minerals or mussel shells. With multiple hydrophone arrays and data-processing techniques, buried cracks and gullies that may contain mineral concentrations can be located and mapped.

NATURE OF BOTTOM

There is another means of determining the nature of the bottom. In water depths to 50 meters, geologists trained as divers can descend and directly examine sediments or rocky outcrops. Sometimes this gives them wholly new ideas about geological processes and suggests means of more effectively using instruments and sampling techniques. In somewhat deeper water, lights and television cameras can be mounted on a sled and towed slowly along the bottom to give watchers on the ship a continuing picture of the sea floor.

Although the sonic profiler produces essential information about the sub-sea structure and allows the geologist to identify old beach deposits, buried stream channels, and other natural traps in bedrock, it is necessary to take actual samples of the mineralized materials to determine the presence and depth of minerals or to outline an ore body. Usually several kinds and qualities of samples are required.

It is relatively easy to obtain rough samples of the bottom material by pumping or airlifting samples of the unconsolidated sediment to the surface to determine if any interesting minerals are present. One can obtain somewhat better samples by lowering a weighted cylindrical caisson which penetrates the bottom by using water to wash away the material ahead of the rim. As it descends, the material inside is pumped to the surface and allowed to flow over a riffled trough which retains the heavy minerals. Dimensions of the sample and depth of penetration are usually not known well enough so that the samples can be used as a basis for calculating mineral grade and ore body size for investment purposes.

THE ROCKEATER

After much study of the problem of how to obtain accurate samples beneath very rough seas, in 1963 Ocean Science and Engineering, Inc. built the prospecting ship *Rockeater* to sample the diamondiferous gravels off the coast of Southwest Africa.

Diamond deposits are particularly difficult to sample because very high values are concentrated in tiny stones which are dispersed through huge quantities of sand and gravel. There is no readily detectable pattern to their distribution although generally the higher values are closer to bedrock. Sometimes a dozen stones will collect in a single small rocky depression while those around it will be barren. And of course the usual graduations in value are absent: either there is a diamond in the sample or there is not. Moreover, there can be a big difference in value of diamonds of the same size—and for stones of equal quality, the value increases exponentially with an increase in size. This means that large samples are required from sample holes of precisely known size. Even so, there is a tendency to substantially undervalue (relative to mining results) the deposits.

Rockcater sampled by drilling large holes—80 cm in diameter—with a heavily weighted bit 8 meters long. Steel claws at the tip loosen the gravel and high-pressure jets churn it into suspension so that an airlift system can bring it to the surface. The ship is held firmly in place by four anchors and is able to drill in waves four meters high. Samples are processed on board in a heavy media plant, and the final concentrate is hand sorted for diamonds. It drills about 30 holes averaging about five meters deep in a 12-hour day. In the first year of operation over 4,000 holes were completed and diamond deposits containing millions of carats were outlined.

The *Rockcater* system has been operating for three years and is regarded as a very successful solution to that specific problem. However, for other kinds of mineral deposits there are equally satisfactory and less expensive solutions.

Undersea placer deposits of gold, tin and rutile are somewhat easier to evaluate. Smaller samples (8 to 16 cm diameter sample holes) give adequate data and value-contour charts made from such samples are more meaningful. The equipment available for making such holes and recovering samples therefrom has generally been inadequate for coarse gravels or rough water.

THE PROBLEM OF SAMPLES

In order to produce results on which an engineer or geologist will stake his reputation, the sampling system must be able to take a continuous sample of precisely known size throughout the unconsolidated section of sediments and gravels to bedrock—preferably a continuous undisturbed core so that layering can be studied and sample values carefully segregated according to depth. There must be no losses from the sample or additions to it; the material immediately above the bedrock (often the site of the best values) must be retrieved.

It is not easy to obtain such samples, but several methods have been used in the protected waters of Indonesia, Alaska, and Thailand. For example, the ancient manual Banka placer drill has been used from rafts. Although samples taken by this method have obvious deficiencies, the uncertainties seem to be counter-balanced by processing losses and poor measurement of dredge volumes so that the results are apparently usable.

Other sampling in tidelands, bays and estuaries have been done by wash-boring or by jetting a pipe into the bottom and pumping or air-lifting the material to the surface. None of these produce a clean sample of known dimensions and geologists can seldom agree on what the results mean. Another method is to use a pile-driver-like engine to drive a double-walled casing into the bottom, continuously pumping the enclosed material up with what is called "reverse circulation." The sample produced is clean and reliable but any layering is destroyed and the device is too cumbersome to use offshore in rough seas.

Therefore, the Horton Sampler was developed to meet our requirements for inexpensive offshore sampling. It was designed to penetrate 30 meters of the very coarse gold-bearing gravels of Alaska beneath 50 meters of water and has been used to sample tin deposits off Tasmania. The Horton Sampler is a vibrating tool (120,000 impact pounds 100 times a second) in which a 15 cm diameter smooth pipe is driven into the sea floor to take a continuous, undisturbed sample of the entire unconsolidated section. The pipe is in 3.3 meter joints and the material inside can be retrieved either as a core or it can be pumped out as the pipe descends. It must be mounted on a ship which can be held in position above the hole by multiple anchors. In rough water one assumes that the ship will be continually in motion following an orbit similar to that of the water particles in the passing waves (a circle whose diameter is equal to the wave height).

In deeper waters where the material of interest is most likely to be surface nodules containing phosphates or manganese, the customary sampling method

is to drag a chain "dredge" with a one meter opening along the bottom. The nodules brought up are assayed and measured; mineral quantities and values are determined by combining these figures with results obtained by studying photographs of the bottom.

In all geological work and sampling, there is a continuing requirement for precise navigation. It is necessary to know exactly where the survey lines were run and the samples taken so these can be made into accurate charts. Often the operations will off low, uninhabited, hazy coasts where there are no clearly identifiable landmarks or usable navigational features. Moreover, since these surveys may extend twenty or more miles offshore, well beyond the range of optical instruments, electronic navigational aids are required. Those most generally used are Decca Hi-Fix (hyperbolic mode), Raydist, Shoran, and Decca radar with transponders. Each of these has its own idiosyncrasies and only rarely do they perform as well or with the accuracy that the manufacturer declares; but with skill and persistence they can be kept operating and acceptably repeatable results can be obtained. Of course, all require that the position of reference points ashore be precisely known and this may require the offshore prospector to do a substantial amount of onshore surveying.

It is hoped that in the next few years some sufficiently precise worldwide positioning system will be developed. For example, the Transit satellite system with a projected accuracy of 100 meters may become generally available.

Undersea prospecting for minerals is plainly a complicated, expensive business where the risk is great and the rewards are unknown. It requires talented men who are well equipped and very determined. With perseverance they will build a great undersea mining industry.

STATEMENT OF WILLARD BASCOM, PRESIDENT, OCEAN SCIENCE & ENGINEERING, INC., WASHINGTON, D.C.

Mr. BASCOM. I think Dr. James' statement was a very fair and sensible statement of the whole business.

Mr. FASCELL. And very succinct.

Mr. BASCOM. I thought what he said was very sound. I think it is best if I start by telling you about our company and its position in the undersea mineral business.

About 5 years ago—we are a new company not much older than that—we became involved with the DeBeers Corp. of Southern Africa in prospecting for diamonds along the coasts of South and South-West Africa. Under contract to them and several other concessionaires out there, our company eventually explored a coastline about 600 miles long in great detail. Although the occurrence of diamonds there was well known, in fact they were being mined, the position of the deposits was not at all clear nor were the reasons why they occur where they do; it was all very vague. We determined approximate boundaries of the ore deposits out there by using geophysical methods and sampling them with a large drilling machine; namely, a ship called the *Rockeater*, which processed the samples on board and determined on the spot whether or not there were diamonds present so the geologists aboard could determine where the next set of holes could be drilled.

Mr. FASCELL. I can read the lead line right now if you will permit me, Mr. Bascom: "*Rockeater* Chews Bascom's Bed."

Mr. BASCOM. Anyway, our problem in that particular area was that although our company did some very nice geophysical and mining sampling work and found a lot of diamonds we did not own the deposits and we thought, never again. Next time we will own the mining property and work for ourselves.

We had, however, established a good relationship with the DeBeers Corp. and when that particular job was completed as far as we were

concerned we proposed that a new mining company be formed. So our company and DeBeers jointly own Ocean Mining A.G., nominally of Zug, Switzerland, operated out of Washington, D.C., of which I happen to be the managing director.

With that company we set about exploring for other kinds of valuable materials under seas elsewhere in the world. We have been so doing for 3 years now. We began with an intensive library study by crackerjack geologists who determined where the most likely possibilities were, then we took a quick look at them in the field, and began the process of taking up concessions. Right now, if Dr. James' figures are correct—that the continental shelf is about 1.3 million square miles—we have concessions on one-half of 1 percent of it.

So, we are fairly large landholders in the undersea deposits of the world. These include deposits off Alaska, where Dr. James' parties have been working; we have concessions in Australia, Tasmania, Philippines, Malaya, and hopefully soon in several other countries in the world.

We, of course, are a commercial venture. We spend our own money, ask no assistance from anyone in the hopes of making money from the minerals of the sea floor. We think our chances of so doing are very good indeed. It means our point of view is rather different from that of other people.

We are not interested in the scientific aspects of this work or of what the world may do 10 years from now. Our problem is how do we survive as businessmen in this unusual sort of venture.

There are already successful underseas and near-shore mines being operated and have been for some years. It is said that undersea tin has been mined off Indonesia since about 1810. It is not exactly rough ocean, but it is beneath open salt water. There are some very successful tin mining ventures off Thailand these days and I have brought along photographs of some of these dredges, as well as those working off the Queensland coast.

There, substantial beach deposits are being mined for titanium and zirconium. There are a number of possibilities in various places for gold, platinum, tungsten, and perhaps other metals. I am only talking about shallow water inshore deposits. The ocean is a tough enough place to work anyway, and you make it as easy on yourself as you can.

The diamond deposits are all within 1 kilometer of shore. Although in some of the areas of Southeast Asia there is shallow water running out for long ways we are not prospecting in greater depths than about 150 meters, possibly less than that, possibly 50 meters for the time being.

These days everything is technically possible. If you have enough money and time and you are willing to make the effort you can do just about anything you want to.

Our problem is to compete in the marketplace. As we see it there is no real relationship between whether minerals are mined undersea or on land. The people who buy your ultimate product, whatever it may be, gold, diamonds or tungsten or something, couldn't care less where you get it from. It is just so many dollars for this material delivered to them.

Your problem is whether or not you can produce it at a profit. If you are a marginal producer you can be forced out by relatively small changes in the price structure.

Our problems have to do in sequence with, first of all, obtaining concession areas, carefully sampling them, and working out the long-term economic forecast for the minerals; for example, what will the tin market be 10 years from now? What will be the available smelter capacity? Who are the big buyers of it? Will something replace tin? That kind of problem.

Having determined that there is a market at some fixed price, one has to have a concentrating method which will save some part of whatever mineral is dredged up from the sea floor.

The modern undersea dredging requires a recovery plant which will pick up on the order of 10,000 cubic yards a day. This is a lot of material. You must run it through a plant very fast and throw it overboard, otherwise you will sink yourself with this large amount of incoming mud and water.

Having determined there is a feasible method for lifting the material and for processing it onboard, your next major problem is the amortization rates of the dredge—considering the tax situation in the particular country that one is working in.

In each country we have a slightly different deal. In the main the deal is like this: "We take up a concession, usually at no cost. You don't pay a fee except a tiny registration fee to the local government. In return for their giving you a large undersea area you agree to spend so many dollars in prospecting it.

Usually the arrangement is that one turns over all the information obtained to the government—who under some circumstances will keep it secret for a couple of years if you ask them to but usually that is not important. Then you have some prearranged deal that if you find mineral deposits which can be called ores—ore, by the way, is a mineral that can be mined at a profit—if you find something that appears to you to be profitable, then you have some prearranged business deal with that government which says that you agree to mine at some stipulated rate and that you get your mining costs back and then you split the profits in some such fashion with the local government, which their profit also includes taxes and whatever else they get out of your operation. You split in some fashion, perhaps about 50-50 with the local government. That is a normal arrangement these days in undersea mining.

We are not exactly mining at this moment, although we have gone through a great many studies like this. Our company, though it be quite small, has had very good luck in arranging consortia with very major corporations around the world.

In our Tasmanian tin adventure, last year we spent about \$700,000 of our own money down there in a consortium which included major British and South African companies, a Tasmanian company and an American company besides ourselves.

We pooled our money and interests and we came close to developing a mine there. It was marginal, considering our knowledge of the business, and we may come back to it later. At the moment we have put it aside in the hope of finding better deposits in other countries.

At present we have one major concession in Indonesia, as part of a British group. We are the only American company. The others represent Australia, England, and South Africa.

I feel that when you are discussing the undersea mineral deposits one of the difficulties in talking about it is that almost nobody appreciates how big the ocean is. When people say it is vast, that is an under-description. It is a very modest statement of the situation. It is unbelievably big.

You can mine the rest of your life on a square mile of territory and the ocean covers literally millions of square miles. If there are any manganese deposits they are so widely spread that it is kind of hard to see how you get any advantage by having any particular area of it. There is just too much of it.

This situation already exists on the northeast coast of Australia. On the Queensland coast and part of the coast of New South Wales, there are very large beach sand deposits. Our company holds probably 10,000 square miles or some tremendous area of it, and so do a lot of other people. Our property is not much better or worse than anybody else's, including a few properties being mined. You can recover titanium, zirconium, a bit of tin, and sometimes a bit of gold.

What is wrong with it is that if you really set about mining this on a heroic scale you would saturate the market in no time at all. The market cannot absorb it. In order to get started you must make a huge capital investment. I think the last operation invested 6 million pounds, sterling pounds, which is quite a sum of money to get started. The operation starts out marginal and probably you don't fall far below it or rise much above it.

The zirconium market gets flooded and you stockpile, and if enough people went into it down there it wouldn't be a good business anymore.

I think that same sort of thing would be true in undersea deposits. The trouble with them is that there is too much of them. You have to compete in the marketplace and you have high initial capital costs.

The mining companies we deal with would be reluctant—that is too nice a word. They wouldn't put up that sum of money for that kind of risk. The Federal Government of this or any other country would be ill-advised to put up their money to get started in a mining venture which would compete with private industry.

I think we don't really have that kind of a demand for manganese at the moment.

I think that concludes my principal statement. I will be happy to answer any questions.

Mr. FASCELL. I want to thank you gentlemen. I must say, on the basis of what you gentlemen have said here this morning, that you have certainly given me an entirely different perspective of the whole problem. I am delighted we have had the opportunity of having you gentlemen here with us this morning.

Mr. Gross.

Mr. Gross. I am somewhat flabbergasted. What I don't know about this subject would fill enough volumes to fill this room. I appreciate what you gentlemen have said.

Is the U.S. coastline still receding?

Dr. JAMES. It is a little hard to say. I think the coast line is moving inland a little on us at the present time. It is not too easy to tell.

Mr. BASCOM. I think you are the right one to answer it. I have written a book called "Waves and Beaches," in which I pointed out that in England a royal commission was set up some years ago to

investigate complaints that the coastline was receding. It made a very careful study of the coastline of England and determined that actually the coastline was growing but the people that were receiving land didn't complain about it, it was only the people who lost land. They were increasing their land.

This really has much more to do with the present state of sea level because of the ice cap structure and things like that. I think it is not known whether it is advancing or receding, but it can't be much of a difference anyway.

Mr. GROSS. Mr. Bascom, you are exploring now in close proximity to the coastlines of the countries in which you are operating, is that it? You are mining—

Mr. BASCOM. That is our mining company. Our parent company, Ocean Science & Engineering, does contract work for other people who are investigating deep sea deposits. Because of the ground rules of our contracts I may not tell you any details.

We have in fact conducted a number of expeditions at sea to dredge for manganese nodules, phosphates, and other kinds of minerals. I can't make a statement on behalf of someone else's company.

Mr. GROSS. You may be exploring in the deep sea but your mining operations up to this point are dedicated mostly to rather close in-shore operations, is that right?

Mr. BASCOM. That is correct.

Mr. GROSS. Of course, when you get out to the deep sea you immediately become concerned about the ability to stake out, if I can put it in these words, stake out a claim? This you have to do in order to justify the expenditure of any money in the deep sea, is that not correct? You have to have some kind of a hold on what you find or the potential for development?

Mr. BASCOM. That is correct. Except that would not be my primary concern at the moment, anyway. I think it would be possible somehow to obtain adequate rights to go ahead if you were anywhere near striking distance of the economics of it.

We have a very good property in tin. For example, a good property would run a dollar a yard in tin, just for a rough number. You have to handle 10,000 yards a day of it. This means you would have to have a very good property indeed to work with it where you have the material you are trying to mine is a couple of miles deep below you. It would have to be exceedingly valuable ore.

In one exercise we did, we did a study for a bank of mining some manganese deposits on the Blake Plateau, which is water only about 2,000 feet deep off the coast of the United States. For a rough approximation we determined that for a capital investment of about \$50 million one could set up a system which would bring in essentially an unlimited quantity of manganese deposits on which our total mining recovery and ferrying the material ashore, for this the total costs were about \$5 a ton. Nearly \$25 a ton would have gone into the processing of it, and I couldn't see us being on the wrong side of the business.

Mr. GROSS. We have no manganese in this country, is that correct?

Mr. BASCOM. I am not the man to answer that question.

Dr. JAMES. We are short on manganese in this country.

Mr. GROSS. Where have we been getting it from, Russia?

Dr. JAMES. Some of it.

Mr. GROSS. Where is the principal source of supply for manganese as of today and past years?

Dr. JAMES. I am not sure I can answer the question properly.

Mr. FASCELL. Why don't we get that for the record, Dr. James? Would you find out?

Dr. JAMES. I would be happy to.

(The information was subsequently provided as follows:)

MANGANESE IMPORTS, 1955 AND 1965

In 1965, the United States consumed 2,866,079 tons¹ of manganese ore and domestic production was 29,258 tons. Ten years previously, in 1955, consumption was 2,109,623 tons¹ and domestic production 287,255 tons.

The principal sources of imported ore, in tons, are as follows:

	1955	1965
Cuba.....	271,733	129,580
British Guiana.....		553,028
Brazil.....	164,049	10,995
Europe.....	17,791	255,995
India.....	699,645	245,582
Congo.....	164,355	40,206
Angola.....	62,621	
Gold Coast.....	232,488	535,196
Gabon and Ghana.....		204,139
Union of South Africa.....	252,092	312,373
Western Africa.....		288,135
Other ²	223,653	
Total.....	2,088,427	2,575,229

¹ Consumption and production totals differ appreciably because of withdrawals from and additions to stockpiles.

² Chiefly Mexico and African countries other than those listed.

Mr. GROSS. I have read in the past of the Russians being a principal supplier of manganese used in this country.

Mr. BASCOM. you are interested in the future control of the deep sea and that is what the committee is presently dealing with.

Briefly could you comment on this this? The chairman in the opening of this hearing said you were not here for that purpose, Dr. James.

Mr. BASCOM. I am not unhappy with the long-standing concept of the freedom of the seas. I am disappointed that so many people who are eager to testify on this subject appear not to have given it a great deal of thought.

I haven't given it enough thought for the long run, so I would not want to give you my advice, whether we should respond in some way to this Malta resolution.

I don't see any real need to control the seas, frankly, right now. I am not concerned with the value of mineral deposits there. Once you really get into the market, and somebody decides they will mine manganese from the sea bottom, in the end it just reduces itself to dollars—to manganese delivered to somebody's factory somewhere. That establishes a price.

The only question is how does that price compete with other manganese deposits in the world. I am sure it will turn out that if you try to go by this route to mine manganese from the ocean floor it would be a higher price than the present one, and all this would do would bring the marginal deposits into production.

When you speak in terms of a national emergency, I presume meaning a fighting war—that is about the only circumstance I can think of

where you would be cut off from outside deposits. The first thing that would be cut off from would be the mineral that you would mine from the sea bottom. That is the easiest target from an enemy standpoint. I can't see that helps you much in time of a national emergency either.

Mr. GROSS. Would it be fair to say that international control certainly at this time would inhibit the exploration by private enterprise such as you have undertaken, the uncertainty of it would inhibit it? Let me put it that way.

Mr. BASCOM. I think that is correct. I would not like to make that as a flat statement until I have thought about it some more.

Mr. FASCELL. It seems to me that one of the questions that needs to be asked at this point—I think you pretty well outlined the parameters of your thinking, Mr. Bascom, on the whole subject—and that is, if you were within striking distance economically of oceanic bed mining, or some other feature which would have a resource, what would you do about protection of your economic rights?

After all, you are talking about long range and large capital investments. It is one thing to say, well, we will take freedom of the seas as a starting place. But now, for example, you may have to decide whether you are going to put in a \$20 million of capital investment because you are within striking distance economically of some resource. Now, what do you do to protect yourself?

Should there be some decision made internationally as to whether or not you will have a right? If you don't have that decision doesn't that raise the question that some people have raised that it is a case of "he who gets there firstest with the mostest"?

Mr. BASCOM. I think that is what it may amount to. I am not sure that I think that is bad. Why shouldn't private enterprise of some country be rewarded in that fashion? Believe me, they will make a tremendous investment. I think they will be concerned about how they are protected.

Mr. FASCELL. That is the big question, though, isn't it?

Mr. BASCOM. It is an astonishing capital investment that will have to be made. I am not sure that any private company in the world would be willing to make it now or in the future for a long time. I doubt that a government should make such an investment in mining to compete with private industry.

Mr. FASCELL. The point is that now in your private enterprise operations on the continental shelf you have concessions from a government which has jurisdiction over its continental shelf. What you have got is a protection for your capital investment and your operation. But without that, how could you make any capital investment?

Mr. BASCOM. That is probably right. OSE probably wouldn't.

Mr. FASCELL. If you have no basis for any protection in the sea or the deep oceanic bed, why would you bother, even if you could get one that is within economic striking distance?

Mr. FRELINGHUYSEN. These gentlemen seem to be saying that there are such great resources in the tremendous area represented by the continental shelf that the deeps, so far as minerals are concerned, probably do not represent any particular asset, and that it doesn't much matter whether or not you get protection if you should try to mine at that level.

We are talking about, as I understand it, depths of over 5,000 feet. If there are such enormous amounts of untapped resources at shallower levels where you can get protection and can secure concessions such as we are talking about, are you suggesting that there is not any meaningful asset out in these deeps?

Mr. FASCELL. Then it doesn't make any difference whether there is an international agreement on the deep oceanic bed, or the United States stakes a claim.

Mr. FRELINGHUYSEN. It seems to me what they are surely saying is that there are easier ways of getting things we need than staking some claim to a place where it is really uneconomic to retrieve anything.

Mr. FASCELL. I would agree with the gentleman. I think we might as well add that the Malta proposal may be "much ado about nothing."

Mr. FRELINGHUYSEN. I would think if we wanted to develop an asset for the United States to share in, we should be talking about the continental shelf, and the utilization of some of the material there and sharing in some concessions.

Mr. FASCELL. That is already resolved by international agreement, so we have both governmental and private industry protection.

Mr. FRELINGHUYSEN. It sounds like "much ado about nothing" to me.

Mr. BASCOM. I didn't mean to say what you think I said.

Mr. FRELINGHUYSEN. I am not trying to put words in your mouth.

Mr. BASCOM. Dr. James said we know very little about the geology of the deep ocean basins and there may be all kinds of possibilities down there, both on the continental slope and in the deep water that we don't know.

Secondly, the reason that our company is spending so much effort in Southeast Asia looking for mineral deposits is that they are not so widely spread on the continental shelves. We look there for minerals which are very specific to that area; we have to look there. We didn't choose Indonesia as a matter of convenience. It is because it happens to have tin deposits there. There is no use looking for tin deposits off Florida, for example, because there is no chance of finding them.

Mr. FASCELL. It is all gold.

Mr. BASCOM. I didn't mean to suggest that the continental shelves had loads of minerals or that it was easy to get them. This is a very tough business.

Mr. FRELINGHUYSEN. I didn't mean to suggest the whole thing is one massive gold mine. Of course you have to be discriminating in where you look. That is your point, that you are trying to be selective and you have taken a small fraction of the area, based on your guess as to where reasonable deposits might be found.

I don't think anyone has yet suggested that the depths, themselves, are likely to produce much of economic value. This isn't to say we shouldn't explore them—

Dr. JAMES. In the relatively near future, I would say there is almost no chance that there will be any development of materials from the great depths. What it will be in the distant future, I don't know, because we don't know what is there.

Our job in the next 10, 20, maybe 50 years, will be to explore this enormous area.

Mr. FRELINGHUYSEN. Do you think it is of any great concern—I am granting that exploration is important—but is it of any great concern whether or not there is national sovereignty over these depths? Does it need to be decided as to just who has jurisdiction or sovereignty? I don't even know the word to use.

Dr. JAMES. I think I better perhaps pass on that question, Mr. Chairman, if you don't mind. There are policy questions here. I may have personal opinions, but I would rather not express them.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. FASCELL. Mr. Fraser?

Mr. FRASER. I am having a little difficulty getting fixed in my mind, Mr. Bascom, where you are currently exploring. Are you exploring on the continental shelf?

Mr. BASCOM. For our own account. We are doing contract work for other people in deep water.

Mr. FRASER. That exceeds the continental shelf.

Mr. BASCOM. We are mainly Pacific people. The average depth is 15,000. If you go to sea out there you have to go to 20,000 feet—

Mr. FRASER. You are participating in the process of ascertaining the kinds of things to be found in the deep areas.

Mr. BASCOM. Yes, sir. One thing I did not say so far, which I should perhaps add, we are also, to some extent, in the oil exploration business. The subject hasn't exactly come up. I don't think of that as minerals. At least it is not the same kind of minerals.

There is, in my judgment, fairly good evidence that there are oil deposits in quite deep water.

As you will recall, in the organizing for the Mohole project, some years ago, our group did drill five holes in water 12,00 feet deep. These are not oil production holes but it shows it is feasible to do it. It is far from a production well for recovering oil. It is possible to retrieve oil at great depths.

I think it is quite a long ways off in the future, but it ought to be kept in mind by your group.

Mr. FRASER. I am not asking you to answer as a lawyer but more from your general experience in this field, when you get out to these depths your impression is that there is no nation, at the moment, who has the right to deny you—

Mr. BASCOM. I think that is true.

Mr. FRASER. You are operating on the principle of the freedom of the high seas.

Mr. BASCOM. I like that principle. It frightens me to think we would have to steam a ship around South America to England and cross over 40 different ownerships on the way.

Mr. FRASER. That is to say, you would regard as a difficult proposition the extension of national jurisdiction into the high seas?

Mr. BASCOM. As I understand the present ground rules, I think under the Geneva Convention, a country, or a representative of any country may follow deposits out as far as their technology will let them go. You can work off the continental shelf and go as far as you can go. We haven't come up against that problem yet, so I am not sure about that.

You will find places in the world where the continental shelf is not well defined, where it slopes off gradually into deep water. It is a more complicated problem than what it seems at first.

Mr. FRASER. I raised that question with one of our witnesses the last time, the——

Mr. FASCELL. Mr. Danzig.

Mr. FRASER (continuing). Because this has been my impression, too.

As your technology becomes better developed, under the definition of "continental shelf," that would automatically lead to an extension of the area over which there was national control.

He denied it.

He said people who are professionally concerned as lawyers or people dealing with the legal side of this would not accept that view. He took the position that it was the technology generally existing at the time the Convention was entered into, that was controlling.

Mr. BASCOM. I didn't understand it that way. I think that Convention is 1962——

Mr. FASCELL. 1958.

Mr. FRASER. Let me read what he said. I will just read this statement. I said:

That's assuming that under the '58 Convention the technology will exist that will permit the countries to assert the claims out as far as the Convention would permit, which as I understand, turns out to be limited by median lines.

The way the Convention reads, if you have conflicting claims you take a series of midpoints, and that defines the lines.

Mr. DANZIG. I would disagree with that position emphatically. I would say that the Convention on the Continental Shelf was limited to what was contemplated by the convening parties in 1958 and at the same time the exploitation of the continental shelf was not seen as very practicable beyond the 200-meter limit.

Mr. FRASER. But by the language of the Convention——

Mr. DANZIG. Yes, I am aware of the language, but I am also aware of the circumstances in which the language was drawn and, in my humble opinion, there is no international authority who would support the position that under the present Convention on the Continental Shelf that the right to exploit the resources of the ocean go out to the midpoint between any continental shelf and the opposite shelf.

I do not accept these lines as the rule of law at the present time.

I wanted to indicate that is the kind of opinion we have been hearing.

Mr. BASCOM. I didn't mean to disagree with that. His legal opinion is probably correct.

I am disturbed at lawyers trying to describe what our existing technology is. It is not very good, and what there is is widely spread. There are not many people clear on what technology is doing.

I am talking within economic bounds. If you have enough money you can do anything, but if you are going to be in the mining business you don't have enough money.

Mr. FRASER. This is hypothetical, but these things turn into realities sometimes.

Supposing you acquired the capability, both economic as well as technological, to go out into deep oceans and extract oil, and that you proceeded to move, say, within 25 miles of the English coastline and began to do this. This, it would seem to me, would present the kind of conflict which one would then want to find a way to resolve.

Let me try to put this question this way: You said you like the principle of the high seas.

Mr. BASCOM. The "freedom of the seas."

Mr. FRASER. Which is, in some respects, an internationalization of the high seas.

Mr. BASCOM. Yes, sir.

Mr. FRASER. That is to say, when you talk about the right to travel on the high seas and the rights incident to it, that this is not dependent upon sovereign rights and there is an international status of the seas.

If this high seas concept is to be extended to the resources of the seas as well—particularly the ocean bed—then one is talking about an internationalization of those as well.

Mr. BASCOM. Yes.

Mr. FRASER. As a practical matter it can be looked at in several ways. For example somebody representing the international community, could work on the guidelines and the conflict resolution question. Or, they might assert certain proprietary interests on the part of the international community.

There are two choices. They are not necessarily incompatible. One could lead to the other. It would depend on the circumstances.

This is a hard way to come to the question.

What I am asking is, would your present attitude toward this be that it would be well to proceed on the international level as contrasted with moving in the direction of extending sovereignty into these areas?

There are a whole range of options open with respect to the way the international approach might be disposed of, whether it was simply resolving conflicting claims of individual entrepreneurs, setting out guidelines or whatever, or moving to proprietary assertions. These would be one range of possibilities as contrasted with nations saying, "Well, we are going to move our jurisdictional and sovereign claims outward into the deep oceans as we are able to."

Mr. BASCOM. I am not sure what international body in the world settles problems of piracy today, if some should arise. If you are out mining and somebody boarded you or tried to take over the ship, you clearly have an international incident.

I suppose the country represented by the owners of the ship is the one that does something about it. It seems logical there might be some international body that could sort out problems that arise.

The problem you have at the moment is that you are sort of trying to outguess what technology is going to be like, and what the world is going to be like 20 years from now, when it becomes a more reasonable thing to do than at the present.

I would say that would be hard to do.

I think you don't start by dividing the ocean up. I think you leave it free until there is some reason to make a specific judgment in some case.

I also think that the very uncertainty that the United Nations can levy taxes on what you might mine off the sea floor is not a very good idea. It would certainly inhibit exploration.

Mr. FRASER. Because of its added cost?

Mr. BASCOM. It is because of the uncertainty of the whole thing. Sometimes the United Nations is very erratic about some matters and that would just be one that would discourage people from going into it.

Mr. FRASER. If you are talking about the U.N. being erratic, I was thinking about your acquisition of concessionary rights from some countries which have recently changed governments.

Mr. BASCOM. Can we keep that out of the record?

Mr. FRASER. I am just making the point that national governments aren't always traveling on a single track, either.

Mr. BASCOM. I appreciate that.

Mr. FRASER. I can appreciate your position.

I was trying to explore this. There are all kinds of choices open to us. One of them is to extend national claims into the high seas and the other is not to do that, but try to find some other answer which either involves international conventions, international law, an international body that may play a role.

Mr. BASCOM. I think there may be somebody who can straighten it out, but don't divide it up in lines.

Mr. FRASER. That is what some people argue that the 1958 Convention already provides. As the technology extends the continental shelf out and out, soon every place in the world—like that map shows—is owned by some nation. That seems to me to be a ridiculous result because it means that Bermuda takes up a good chunk of the Atlantic Ocean and has these rights that accrue to it.

I have drawn you from the technological side of it, but I wanted you to at least understand some of the problems that we can have.

Mr. FASCELL. I think Mr. Fraser's questions are directed to the problem that is before us, before private industry, and before the governments. We did, in prior discussions, get to the specific question of the present international Convention on the Continental Shelf and exactly what it means.

It is obvious already that you have tremendous differences of opinion—legally, technologically, geologically, and otherwise, as to the meaning of that one paragraph in the international Convention on the Continental Shelf.

One of our colleagues in the House of Representatives has interpreted it to mean that a nation's claim can reach the midline of an ocean or the midline between two continental shelves. There is a pretty strong basis for that, because such an arrangement already exists in the North Sea. I don't know whether that is good, but at least there is an arrangement.

Then a great many questions could arise, as Mr. Fraser has brought out, about resolving conflicts. You have raised one yourself on the question of protection from piracy.

Actually, you have presented us here with a point of view which is, I would say, a mid-point between two basic concepts. Yet it would appear to have a lot in it in favor of some internationalization of the problem. In other words, it is entirely possible, as Mr. Fraser points out, to have an option whereby you could maintain the concept of international water and yet have some international agreement or agency to resolve the conflicts which the international Convention on the Continental Shelf, itself, attempted to do.

It might very well be, therefore, that the Maltese proposal would bring about an inquiry with respect to the resolution of the differences of opinion that exist on the present international convention. If there is a difference of opinion, and there obviously is, it seems to me it ought to be resolved as rapidly as possible, even though it might take 10, 15, or 20 years to do anything with respect to the actual extraction of resources from the oceanic bed.

That leads to another question. I would like to be sure about the language that we are talking about. I have a very hard time with definitions in this matter. Are we talking about oceanic basins as meaning oceanic beds, and are we talking within that meaning about that which is beyond the continental shelf, or the slope, or both?

Are there three distinctions, Dr. James? Or four?

Dr. JAMES. In places the distinctions are very clear cut. Elsewhere they fall down.

Mr. FASCELL. When you talk to your colleagues, what terms do you use, so I will know what you are talking about?

Dr. JAMES. We use these terms, use them rather loosely.

Mr. FASCELL. Which terms?

Dr. JAMES. The continental shelf, in general out to a couple of hundred meters of depth, but that depth is not a really fixed one—is the continuation of the profile of the continent out into the water. Then the continent slope, which is where the profile steepens abruptly. This is most clearly shown, of course, off our east coast where it steepens abruptly. Then that steep slope gives way to a virtual plain with a very low slope to it; now we are in the deep ocean. This is the deep ocean basin.

Complicating the issue, of course, is the existence of the mid-oceanic ridges which comprise the greatest mountain chain on earth.

Mr. FASCELL. Why does this complicate it?

Dr. JAMES. This is part of the ocean. If we call them "oceanic basins," the ocean basins include the greatest mountain chain on earth.

Mr. FASCELL. You have a basin with a mountain in it?

Dr. JAMES. Undoubtedly the greatest mountain chain on earth.

Mr. FRASER. Why is it the greatest?

Dr. JAMES. The most continuous, highest.

Mr. FRASER. How high is it?

Mr. FRELINGHUYSEN. Have you seen this map of the Indian Ocean with the ridge running through it?

Mr. FASCELL. Therefore, so we have some rather fundamental definitions, but a little fuzzy on the edges, and only on some occasions.

Dr. JAMES. Essentially the ocean basins, as we speak of them, begin at the edge of the continental slope and go out. There are a lot of complications in that basin, such as the oceanic ridges. Fundamentally, in terms of the crust of the earth, this is a different kind of terrain, different country than the continents.

Mr. FASCELL. As Chief Geologist, do you have anything to do with the Department of the Interior granting mining licenses to American businessmen for exploration at depths of 4,000 feet, which is clearly beyond the shelf or perhaps even beyond the slope?

Dr. JAMES. Yes, we grant leases. The Geological Survey does supervise and issue such grants for exploration, and then later for exploitation. It doesn't happen to be in my particular division. It is not under me, as Chief Geologist. It is under the Conservation Division of the Geological Survey.

Mr. FASCELL. Who heads that?

Dr. JAMES. Russell Wayland.

Mr. FASCELL. How does our Government go about granting a license, a permit, a lease?

Dr. JAMES. We grant an exploration permit, first of all; yes.

Mr. FASCELL. How do we grant one beyond the continental shelf and beyond the continental slope?

Dr. JAMES. We don't grant any beyond the continental slope but there are permits for exploration at least close to the edge of the slope on the east coast. A consortium of companies has been drilling off the east coast with such a permit.

Mr. FASCELL. As far as you know, Dr. James, the United States has not granted any exploration rights beyond the continental slope?

Dr. JAMES. That's right.

Mr. FASCELL. Please go on.

Dr. JAMES. Perhaps I have to qualify that a little bit.

The continental slope is very difficult to define off California. There are—

Mr. FASCELL. So we may have? The answer is, we may have?

Dr. JAMES. We may have, off California—

Mr. FASCELL. And we won't know until someone questions it.

Dr. JAMES (continuing). Because we get into deep water relatively quickly offshore in California. The geology offshore in California is complicated and we can get into deep water quickly. When we are in the oceanic depths it is another question, but we are in fairly deep water. I think there are drillings that are going on there at depths, I believe, at around 3,000 feet.

Mr. BASCOM. I don't think there is anything that goes that deep, but around 1,000.

Mr. FASCELL. Mr. Bascom, I understand the Treasury Department has a ruling that resources or earnings from mining operations conducted beyond the continental shelf, when brought into the United States are subject to import duty; is that correct?

Mr. BASCOM. I have heard that ruling; yes, sir.

Mr. FASCELL. It would be rather interesting from a business point of view to know, whether or not one was in the United States or outside the United States in connection with its continental shelf limits. It would seem quite important.

If a businessman obtained a lease or an exploration permit from the Bureau of Mines or the Department of the Interior, it seems to me to be prima facie evidence from the standpoint of the Treasury that he, the operator, wouldn't have to pay an import duty. That raises the important question of people going to the Department of the Interior to get exploration rights, when the demarkation might be fuzzy, or where the continental shelf runs out 200 or 300 miles beyond where it ought to. This would appear to result in saving a lot on import duty.

Is there a problem on that today?

Mr. BASCOM. I think I should be completely frank with you and say that the United States is one of the most difficult countries to deal with in the world. I don't mean this unkindly. We have a set of laws and our people carry them out, but it is not easy to make an arrangement of any kind with the U.S. Government or settle questions of passports or flags—

Mr. FASCELL. You mean too many chiefs and not enough Indians?

Mr. BASCOM. No, I don't exactly mean that. Most countries are rather anxious to have their offshore deposits explored by somebody else at somebody else's costs, and to split whatever profits might come about.

In the United States, for example, we have had these holdings in Alaska, I believe, for a bit more than 3 years. I think we hold around 20,000 acres, or something like that in Norton Sound, which is some land at which the Bureau of Mines has been looking at this summer.

Our claim, I guess they call it claims, our holdings extend out to the 3-mile limit in the State of Alaska. Beyond that it is Norton Sound and clearly within U.S. territorial waters, and I think it is impossible to get an answer back from the proper Government agencies as to what their intended disposition of that is. You can as far as Alaska goes, but you may not deal with the Federal Government there. They sort of return your letters unopened and say, "Write us back in a few years."

If you are going to operate as a U.S. company on the high seas now, you must probably have vessels of over 300 gross tons and you must meet all the Coast Guard crewing restrictions, which are very difficult. You cannot compete in the world market under such regulations.

I suppose if our company was going to operate on the high seas under some hypothetical circumstance we literally could not afford to have an American-flag ship because of the very difficult ship regulations that go with it.

As far as safety regulations are concerned we always meet all the American Bureau of Shipping standards and we are insured with Lloyd's and we meet all safety regulations, including U.S. Coast Guard, but the crewing requirements are impossible on U.S. ships.

If you are going to work in the high seas, you have to have a ship, and the evidence is straightforward, you almost couldn't afford to mine in the high seas and bring the ship back to a U.S. port with a U.S. flag on it.

Mr. FASCELL. Then our present methods and systems might, in the future, drive all of this business to other nations?

Mr. BASCOM. I don't mean to be unkind but that is realistic. It is difficult to make an arrangement with the U.S. Government where it is relatively easy to deal with Australia, for example.

Mr. FASCELL. What is the potential for living under the sea today and in the next few years, and how would this change the picture?

Mr. BASCOM. What would be the purpose of living under the sea?

Mr. FASCELL. We seem to be struggling for land everywhere. Perhaps we will arrive at a point where this is carried to the bottom of the sea as a place to live. What do you think?

Mr. BASCOM. I don't think that is an appropriate thing for me to comment on at this time. In my judgment our company doesn't have any need to have people living under the sea.

Mr. FASCELL. How much ocean-floor mining potential is being exploited at the present time, and what does it look like 10 years from now and 25 years from now?

This calls for some predicting, I know.

Mr. BASCOM. I don't think very much is being exploited at the present time. First of all, you must develop a technology—which is coming along nicely—but any major project in the minerals business, the development of an oilfield from scratch or a large major mine, you are certainly talking about 7 years of development time.

We have only been working at this for 3 or 4 years now, so give us at least the average time on land before you come back and ask "What can you do in the ocean?"

The technology of our company, I think, is at least equal to anybody else's in the world, so we are approximately in the forefront of what is going on. The deepest dredges today, by the way, working in the sea, can only reach 100 meters, water and material, whatever that may be.

It is certainly possible to build ones that will go somewhat deeper but you get into real engineering problems in short order. It has to do with strength of materials, and bending stresses in beams, and hydraulics problems. It is all fundamental engineering. It is the question of, "Can you design something within a budget that can stand?"

Mr. FRELINGHUYSEN. A quick question.

How does exploration for oil compare with minerals? It sounds to me as if oil would be much easier to recover and be economically more feasible than minerals. You wouldn't have to worry about depth if you have already drilled holes 12,000 feet under the sea. It would be relatively simple, I should think, to develop a floating island and bring tankers to it. Are we active in this area?

Mr. BASCOM. There is tremendous income already from the U.S. oil industry. In fact, the U.S. undersea oil business sort of dominates all undersea drilling around the world. They are largely American companies with American know-how. It is unusual for them to drill in water at depths greater than 300 feet. It is probably less than that. The deepest ones that any of the real "pros" in the oil business talk about, and I am not one, is 600 feet. Important people in that industry say they really see no chance of going beyond 600 feet for a very long time.

I am repeating someone else's views in this thing. I think they are possibly right. The fact that you can do it doesn't mean you can compete in the market price—

Mr. FRELINGHUYSEN. You mean from an economic point of view?

Mr. BASCOM. Yes.

Mr. GROSS. You are speaking of 600 feet of water?

Mr. BASCOM. Yes. You can go much deeper, 5,000 to 15,000 feet beyond that. In the mineral business we are only talking about placer deposits lying on the sea floor.

Dr. JAMES. The total value of the offshore production at the present time off the United States is about \$7 billion. We have actually recovered that value of material, largely oil and gas.

This brings in large returns to the state and Federal treasuries. There has been a return of about \$4 billion to the state and Federal treasuries as a result of this offshore work. At the present time the oil industry is drilling offshore at the rate of \$2 million a day. They have already invested about \$7 billion in offshore exploration.

Mr. GROSS. Beyond the 3-mile limit?

Dr. JAMES. Both within and beyond.

At the present time the value of the production from the outer continental shelf beyond the state limit is about \$4 billion, and the total value from offshore is about \$7 billion.

Mr. GROSS. Is there an import duty on that oil?

Dr. JAMES. No.

Mr. GROSS. Are they licensed?

Dr. JAMES. Yes, though there are things I know little about.

Mr. FASCELL. Mr. Bascom, I just want to get back to one thing that we have touched on several times. I want to be absolutely clear on

this in my own mind, and on the record, by the way. My interpretation is that there would be a useful purpose in bringing together countries through some international arrangement or meeting to clarify any conflict or differences of opinion that may exist regarding the present international Convention on the Continental Shelf and continental slope so as to prevent the kind of midocean line drawing as displayed on the map which we put into the record the other day. Such division of the areas into "natural lakes" would be contrary to the concept of freedom of the seas, internationalization of waters, and would obviously inhibit any future exploration by private industry. Is that correct?

Mr. BASCOM. That is correct. I agree with what you have said.

Mr. FASCELL. Thank you very much.

Are there any other questions by the members?

Mr. FRASER. Why would that approach obviously inhibit exploitation?

Mr. BASCOM. Finding those lines out in the middle of the ocean isn't too easy a job either.

Mr. FRASER. No, if you were going to the edges you might have trouble. Somebody can draw them on a map and you have latitude and longitude and you can stay within them. Why would that inhibit them?

Mr. BASCOM. The first part of his statement was that there should be some kind of body which should reexamine what has been written and see if it is clear to everybody. There is no use to prejudge what that group will come up with. So I am less enthusiastic about the latter part of the statement. I think it may come out as Mr. Fascell has suggested.

Mr. FASCELL. We have suggested, if the gentleman will yield, that there is the problem of this midline division of the oceanic beds. Obviously this immediately modifies the concept of freedom of the seas and international waters, and raises the question the minute you exercise sovereign jurisdiction on the ocean bottom itself, as to the sovereign jurisdiction of the water above it.

In the international convention it is very clear that sovereign jurisdiction over the continental shelf does not in any way modify the concept of international waters pertaining to the waters above the shelf. However, if this midline division is accepted and there is a rush by countries to take jurisdiction of the ocean bed on this basis, the whole specter of tearing up international agreements with respect to freedom of the seas arises, and particularly the question of claims to the waters. As I see it, then, if they can be economically exploited for minerals, the waters themselves may become a tremendous resource.

Mr. FRASER. My problem with the drawing of the lines is that it wouldn't facilitate exploitation. I think it might.

The problem lies in the equity of the matter, that a tiny island like Bermuda takes up a large share of the Atlantic Ocean contrasted to an inland state in South America or Africa, which has no access to those resources. If one agrees that this is inequitable and is an absurd thing, then how do you make a division?

An international arrangement seems to make the most sense in order to work out rules that appeal to mankind as an equitable approach.

Mr. BASCOM. You must remember that I started in by saying that I am here as managing director of a Swiss company. That country doesn't have anything at all out there. I am not worried about it.

Mr. GROSS. I didn't understand Mr. Bascom to say he was in favor of internationalization.

Mr. BASCOM. What I said, I think, was that there is no reason to change the present general treatment of the open seas but that if there are uncertain points in this particular resolution that they should be clarified.

I wouldn't want to guess in advance what the result of that convention will be.

Mr. FASCELL. You are not fearful of the examination of the whole problem? That is the point.

Mr. BASCOM. No, sir.

Mr. FASCELL. Gentlemen, we want to thank you very much for taking your time to be with us this morning to discuss this very fascinating and important subject.

Both of you have made a substantial contribution, not only to my education, but to the record. For that I am very grateful.

Thank you very much.

The subcommittee will now go into executive session.

(Whereupon, at 11:28 a.m., the subcommittee proceeded into executive session.)

EXECUTIVE SESSION

Mr. FASCELL. The subcommittee will come to order.

We have with us this morning Mr. David H. Popper, Deputy Assistant Secretary of State for International Organization Affairs, who is accompanied by Mr. Herman Pollack, Director of the Office of International Scientific Affairs, and Mr. Gerald Helman, Office of International Organization Affairs of the Department of State. They are here to give us some information.

Mr. GROSS. Of what? The State Department?

Mr. FASCELL. Yes.

STATEMENT OF HERMAN POLLACK, DIRECTOR, OFFICE OF INTERNATIONAL SCIENTIFIC AFFAIRS, DEPARTMENT OF STATE

Mr. POLLACK. If I may open with a brief word.

The Congressional initiative that resulted in the National Marine Council establishment last year and the National Commission had among its other products of intensified governmental activity the establishment by the Secretary of State of a Committee on International Marine Policy.

This was an international committee very large in scope. We had, I think, a total of 15 different agencies represented on one or another of its committees.

We have been making a rather intensive review of this Government's international involvements in various facets of the marine sciences. We have been seeking guidelines with respect to future possibilities for international activity and cooperation in the oceans, and we had anticipated and had been developing preliminary governmental

attitudes toward the question which is now before us, and we will be talking with you as to the movement of technology, and its consequences into the deep ocean floors.

I don't think when we began this process we had quite anticipated the speed at which the problem would be put before us. But Mr. Popper will be describing to you the actions that have precipitated international consideration of the deep ocean floors.

I simply wanted to set the framework that what we are now doing is the result of a number of months of intense intergovernmental consideration of the problems that are now with us.

Without further ado I will ask Dave to speak to this.

Mr. FASCELL. Mr. Popper.

STATEMENT OF DAVID H. POPPER, DEPUTY ASSISTANT SECRETARY FOR INTERNATIONAL ORGANIZATION AFFAIRS, DEPARTMENT OF STATE

Mr. POPPER. Thank you, Mr. Chairman.

I am very glad to carry on from the discussion which we were fortunate to have with the subcommittee, you will remember, on the 22d of September, I think it was. At that time we explained to the committee why the subject of the exploration and exploitation of the deep ocean floor had come to the forefront in the United Nations and elsewhere.

You will recall that we pointed out that the issue had been brought to a focus in the United Nations because Ambassador Pardo, of Malta, had introduced for the agenda of the U.N. General Assembly an item entitled "Declaration and Treaty Concerning the Reservation Exclusively for Peaceful Purposes of the Seabed and of the Ocean Floor, Underlying the Seas Beyond the Limits of Present National Jurisdiction, and the Use of Their Resources in the Interests of Mankind."

The memorandum attached to that proposal for an agenda item indicated that Ambassador Pardo suggested such a treaty should reserve the deep ocean floor for peaceful purposes only; that the net financial economic benefits for the exploitation of the floor should be used for developing countries; and that the treaty he had in mind should establish some kind of an international agency which would assume jurisdiction as a trustee for all countries over the seabed and ocean floor. Those were the ideas he included briefly in his memorandum.

Since that discussion on September 22, the General Assembly has adopted its agenda including this particular item, although it has changed the title of the item so as to eliminate the reference to the "treaty," reflecting, I think, a fair degree of caution as to how far and how fast we want to go on this matter. We think that was a judicious decision.

The subject has been allocated to the Political Committee of the Assembly in recognition of its great political importance although there was some problem as to whether it shouldn't be considered as an economic or legal matter. In the end it was decided to consider it as a political matter.

We have had some difficulty in organizing the Political Committee, in determining what items it should take up first and which it should delay.

[Security deletion.]

In this circumstance the Political Committee has begun its work by handling the problem of outer space, which is not particularly contentious this year, and may soon move to a preliminary discussion of the Maltese item.

Preliminary discussion would presumably include first an introductory statement by Ambassador Pardo in which he would lay out his ideals in greater detail,¹ and preliminary statements by other interested countries that wanted to kind of set the tone for what will happen.

Then under the present thinking, and I stress this is subject to change, under the present thinking they would drop this item for the time being and go on to other items—Korea, the nuclear free zone—and come back to this at a later stage in the course of the Assembly, maybe near the end of November.

This is the tentative arrangement as it looks today. It is subject to change. We did want to be sure before Ambassador Goldberg made his first intervention that we gave you the thrust he might be taking and consulted with you on it.

You recall that we have long stressed the need for a good deal of additional study before the United States could reach definitive conclusions on this broad subject. All of us in a sense are groping in an area in which not much has been done. We are certainly unclear as to the possibilities economically. We surely don't know as yet precisely what the security implications are. There is so much work to be done that it would clearly be a mistake to proceed to develop conclusions at this time.

So when Ambassador Goldberg rises to speak he will necessarily be fairly general. [Security deletion.]

I shall try to review briefly the main things we have in mind. [Security deletion.] What I am about to discuss includes the main points in our basic position for this Assembly session.

I might say that first of all he will of course stress the need for careful study and deliberate procedure to determine the proper legal and political basis for activities on the ocean floor. He would suggest that immediate action of a definitive nature would be premature, and he would express a hope for international cooperation in further exploration and research.

We would suggest to him also that he point out how serious and delicate it is to deal with the national security aspects of this problem and how uncertain it is to try to deal with presumed economic benefits and interests at a time when we don't know what they may be.

The major specific proposal which we expect Ambassador Goldberg might make would be to establish what we have called a Committee on the Oceans, a Committee on the Oceans which would work on the pattern of the outer space committee.

[Security deletion.]

It would serve as the focal point for all subsequent United Nations General Assembly action on marine questions.

This would mean that it would be such a committee which would receive the report which you will recall the Secretary General of the

¹ See Appendix, p. 267, for text of Ambassador Pardo's statement, November 1, 1947, in Committee I at the U.N.

U.N. is making. He began last year, and the report will be presented to the next Assembly. It would receive that report and it would consider the possibilities for international cooperation in research and exploration, which will presumably be laid out in that report when it comes out.

Moreover, we think the committee might consider legal questions of the type raised in the Malta proposal. What kind of a legal regime do we want in the deep seas, and what do we look toward on security questions and economic questions? The committee would make recommendations to the General Assembly and it would decide where to go from there.

In the outer space area I think we began the process in 1958. It culminated with the conclusion of the Outer Space Treaty just a few weeks ago.

The Ambassador would in this speech or later forecast the need for principles or guidelines. The discussion I happened to hear just before we came on today indicates, I think, very clearly the need for decisions on these matters at some time.

I might mention just one facet of that. Our thinking is that if legal principles are to be worked out and generally accepted through the U.N., we think that they ought to exclude the competition of national sovereignties on the deep ocean floor.

The direction we see a need for is toward an open and nondiscriminatory regime which would permit the development of the deep seabed on what we would hope would be the best possible terms.

More than that, we would hope that at some stage Ambassador Goldberg could refer to the need for encouraging cooperative action for scientific purposes. As we see it, the U.N. is well fitted to stimulate and coordinate scientific and exploratory activities.

We wouldn't expect that the U.N. would be operational. We would expect I think that maritime nations would be operational but stimulating, coordinating the work which different nations do is clearly a job for some international agency.

[Security deletion.]

Finally, on arms controls questions we intend to stress the complexity of the problem. There are a number of difficult features about it. [Security deletion.]

We think we can make our views known on this and there will be no immediate action on it. Of course, this is not an area in which we can be bound without our own consent. We don't anticipate the focus of the discussion will be mainly on this subject initially.

Finally, I would like to say we intend to keep the committee advised at your convenience and pleasure as this subject opens up and develops in the Assembly. It is difficult to see at this time just how far they will get or what specific kind of action they will want to take. I doubt it would be possible in a large body like the Assembly devoting only relatively few days to this to get down to specific decisions. That, I think, is probably out of the question. We could expect a procedural result such as the establishment of a committee of the kind I have mentioned and then we would work on from there over time.

Mr. FASCELL. I want to thank all you gentlemen for following up on your own initiative the discussion we had in the last subcommittee meeting and bringing us up to date on developments relating to this subject.

When would Ambassador Goldberg be making his initial intervention?

Mr. POPPER. It might be sometime next week, Mr. Chairman. I am not sure of the day. As I said, it might not cover the whole range of things I have discussed. This is our fundamental approach to the position this year.

Mr. FASCELL. This is your preliminary fundamental approach, all of which you might not use and probably won't?

Mr. POPPER. I think that is a fair statement.

Mr. FASCELL. [Security deletion.]

Does anyone want to ask any questions, at this point?

Mr. GROSS. I was somewhat intrigued by Mr. Popper's opening statement that he didn't know what Mr. Goldberg was going to say for an opener at the United Nations meeting.

Doesn't the State Department know what he is going to say on a subject of this kind before he says it? Is his position cleared in the State Department or is he on his own up there, free to say anything he wants to?

Mr. POPPER. No, sir; his statement will be cleared with us. We don't have it yet. I don't know how much of the framework I have given you will be included in it. This will depend, I think, on what his staff finds out about the scope of this preliminary debate.

Mr. FASCELL. How about doing this for us, if I may intercede at this point: At or about the time that the Ambassador is about to go to that committee meeting and is carrying his speech with him, how about sending a copy over to us so we can get one to Mr. Gross.

Mr. POPPER. As soon as we get a firm text we will be glad to send it on. It may be at about the time he makes it.

Mr. FRASER. I understand that goes right up to the wire?

Mr. POPPER. I am sorry to say sometimes it does.

Mr. FASCELL. We understand that. It would be helpful if we could have it.

Mr. FRASER. What you said sounds very sensible to me. How does that relate now to the Malta proposal? That is to say, if I understand the Malta proposal, it sets out some further general guidelines which it urges the U.N. to consider, although I gather the guidelines are still fairly general.

Mr. POPPER. They are.

Mr. FRASER. This in a sense stops short of that. It doesn't take a position on those guidelines but in effect says, This is the way we ought to move to begin exploring these questions; we ought to create this committee.

I presume the problems of the ocean are sufficiently complex so you may end up dealing with only one facet of it at a time, is that so?

Mr. POPPER. I think that is correct. [Security deletion.]

Mr. FASCELL. We don't foreclose any options by taking this procedural step.

Mr. FRASER. I hope you will work very hard at this. I hope you can do it in such a way so that people don't get concerned that we are giving away some vital security interest, and thus increase the chance of acceptance. I feel strongly about the need to keep working at what

¹ See Appendix, p. 277, for text of Ambassador Goldberg's statement, November 8, 1967, in Committee I at the U.N.

I call the sense of international community. I think the world is kind of coming apart at the seams.

I hope the United States isn't going to be the one that is dragging its feet. We have vital interests that we have to protect. If we don't, it creates problems here when we try to ratify something. Keeping that in mind I hope we are able to move.

MR. POPPER. I think, Congressman, that the job of reconciling our own interest and the general interest is not insuperable. We hope and think——

MR. FRASER. It is a matter of hard work sometimes.

MR. FRELINGHUYSEN. I have a quick question about the practicality of cooperation in exploration and research.

You started off by saying the Ambassador is going to lay the foundation, that this is a desirable goal, and a committee should discuss practical ways in which this might be carried out.

Is there much being done along those lines now? Also, if there should be a sudden decision on the part of the U.N. that hereafter exploration in the depths should only be done on an international basis, might we not be hoisted on our own petard if we said we think this should be an international effort? Isn't this possibly going to limit the way in which as a practical matter these frontiers are going to be examined?

MR. POPPER. I wouldn't conceive it quite that way. Maybe when I have made a couple of points Mr. Pollack may want to speak to this question, because he is so familiar with the scientific aspects.

I would conceive it to be somewhat on the model of the International Geophysical Year where scientists getting together, block out areas that need to be explored, and they try to allocate the jobs.

That doesn't mean we wouldn't be free on our own to do additional things in the field of science and exploration if we decided they should be, but it does mean you would have a kind of rational division of labor by agreement.

MR. FRELINGHUYSEN. Is that what happened in the Geophysical Year?

MR. POPPER. The Russian scientists did these things and ours did these and others, and so on.

MR. POLLACK. This was a typical pattern of oceanographic research. It has been true in the Indian Ocean.

MR. FASCELL. It is being done right now. It is nothing new.

MR. POLLACK. That is correct.

The ocean covers seven-tenths of the globe and for the most part it is still unknown.

MR. GROSS. Don't we know that? That is well known, isn't it?

MR. POLLACK. Yes.

MR. FRASER. It is well known it isn't well known.

MR. POLLACK. There is room for collaborative effort.

MR. GROSS. Are the Russians engaged in this? Do they have a ship and an operation such as Mr. Bascom presented here this morning?

MR. POLLACK. I am not sure, sir, what he represented.

MR. FRELINGHUYSEN. Free enterprise.

MR. GROSS. Of course. This is what I am getting at. Are you getting ready in the United Nations to equip a ship and send it out? Of course,

the United States will pay the bill if you do. If this is the suggestion and we go for it, we will finance the thing—

Mr. POLLACK. We don't contemplate that the U.N. as such will perform any operation. We do contemplate that it will be a coordinating body and we contemplate the Soviet Union would play a significant role because they do have oceanographic research vessels.

Mr. GROSS. If you can duplicate what private enterprise is doing, if Congress will supply the money, you will do it in the United Nations. At least, you will try to do it.

Mr. FASCELL. This has nothing to do with the United Nations, Mr. Gross, as far as the research is concerned.

Mr. GROSS. The State Department and through the State Department up to the United Nations.

Mr. FASCELL. We are talking about the U.S. Government. We are not talking about the United Nations.

Mr. GROSS. When we talk about Goldberg and his speech at the United Nations on this subject—

Mr. FRELINGHUYSEN. It is a question of whether or not the U.N. can be useful in coordinating the various efforts that are being made, and explore problems that still need exploration.

Mr. GROSS. If the United Nations can coordinate this, it will be the first thing it ever did coordinate.

Mr. ROYBAL. The makeup of the Committee on the Oceans is rather indefinite. [Security deletion.] What are the guidelines that will be used to set up this committee?

Mr. POPPER. The normal guidelines for such a thing are fairly well known through experience. First of all I am sure all the major maritime powers in the field would be included.

Second, you would move toward the kind of general pattern that reflects various regions and interests. So you get as broadly a representative group as you can.

Mr. ROYBAL. [Security deletion.]

Mr. FASCELL. I can't see any inhibition in what you have said here at all or any reason for concern, frankly, at this point. It seems to me we are taking a very tentative position with ample flexibility to keep every option open.

I think we need to stress again the point which Congressman Fraser made, and that is to make this abundantly clear in the Halls of Congress.

Mr. FASCELL. Once again let me express our thanks to you. We appreciate your keeping us posted. At any time, if you will let us know, we will be prepared to sit down with you and hear from you again.

(Whereupon, at 12:03 p.m., the subcommittee adjourned.)

THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

WEDNESDAY, OCTOBER 25, 1967

HOUSE OF REPRESENTATIVES,
COMMITTEE OF FOREIGN AFFAIRS,
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS.
Washington, D.C.

The Subcommittee on International Organizations and Movements met, pursuant to adjournment, at 10:10 a.m. in room 2172, Rayburn Building, Hon. Dante B. Fascell (chairman of the subcommittee) presiding.

Mr. FASCELL. The subcommittee will come to order.

We meet this morning to continue our hearings on the question of jurisdiction over ocean floor resources.

In the hearings which we have held thus far, a few facts have begun to emerge with increasing clarity.

We learned, for example, that the mineral resources located on the continental shelf and the continental slope are potentially so vast that their uncontrolled exploitation could seriously disrupt world markets for certain minerals.

We also learned that very little is known thus far about the resources located beyond the continental slope—on the floor of the deep sea. While our marine technology is developing rapidly, it has not arrived at the point at which extensive exploration for deep ocean resources and exploitation of such resources is feasible.

We learned further that the law of the sea is full of ambiguities and voids. That law, for example, does not clearly define the limits to which national sovereignty extends over the adjoining oceans. Neither does that law define with any precision the boundaries of the continental shelves since the international convention on that subject leaves part of the definition to be provided by the changing technology of marine exploration.

Neither does the body of law define the status of the resources located on the floors of the deep oceans—more particularly, international law does not say whether such resources belong to no one and are thus available for individual and national appropriation or whether they belong to the human community as a whole and thus ought to be shared by all the members of that community.

In summary, the information supplied by our hearings to date makes all the more difficult any definite decision on the issue before us.

To help us pursue our inquiry—and possibly to introduce some additional complicating considerations—we have called upon the major

civilian action agency of the U.S. Government, the Department of the Interior. The Fish and Wildlife Service, the Geological Survey, and the Bureau of Mines are among the Interior offices which deal with matters relating to the field of the marine sciences.

We are pleased to welcome a good friend, Dr. Stanley A. Cain, Assistant Secretary for Fish and Wildlife and Parks, Department of the Interior. Dr. Cain is accompanied by Mr. William M. Terry, Assistant Director, International Affairs, Bureau of Commercial Fisheries; and Mr. Cleo F. Layton, Staff Assistant, Office of Assistant Secretary for Fish and Wildlife and Parks, Department of the Interior.

Mr. Secretary, we have one question, which we hope you will help to answer during the course of these hearings:

As you know, our subcommittee has before it some two dozen resolutions expressing opposition to vesting of title in the United Nations or some other international body to the resources located on the ocean floors. These resolutions were prompted by a proposal advanced in the U.N. by Malta, originally suggesting the preparation of a treaty to give the U.N. jurisdiction over the exploration of deepwater resources.

What we would like to know is this. What is your reaction to the Malta proposal? What problems do you envision that this proposal could entail for the action agencies in the civilian sectors of the U.S. Government?

We trust your testimony will touch on all these issues. Mr. Terry and Mr. Layton, won't you join Dr. Cain at the table?

Dr. CAIN. Thank you.

Mr. FASCELL. Dr. Cain, you have a statement, so you may proceed.

STATEMENT OF HON. STANLEY A. CAIN, ASSISTANT SECRETARY FOR FISH AND WILDLIFE AND PARKS, DEPARTMENT OF THE INTERIOR

Dr. CAIN. Thank you, Mr. Chairman, members of the committee. I do have a brief statement which I would like to read to you, if I may.

The committee has requested the views of the Department of the Interior with respect to House Joint Resolution 816, in opposition to vesting title to the ocean floor in the United Nations. I appreciate the privilege of appearing before the committee to discuss this resolution and to indicate that we are in agreement with the objectives of it.

The Department is the principal operating agency of the U.S. Government in the fields of minerals, water, and living resources of the sea. It is deeply concerned with questions which touch upon ownership of, or sovereignty over, these resources, be they national or international in character. It has noted with satisfaction the coming into force of the Law of the Sea Conventions, as an orderly part of the development of international law. It has supported U.S. participation in numerous multilateral and bilateral agreements for conservation and management of the seas' living resources.

In respect of minerals, the Department has issued oil leases in areas covered by over 1,000 feet of water. Presently, oil production has ad-

vanced to areas beneath 285 feet of water, and will advance to 345 feet in the near future.

In the case of hard minerals, current technology has permitted production to depths of about 150 feet. However, a phosphate lease has been granted off the California coast, in 240 to 4,000 feet of water. In the Department's view, these actions are compatible with provisions of the Continental Shelf Convention.

It is the Department's view that any change in the legal regime of the ocean bottom outside the limits of the continental shelf should be made only after careful study. It recognizes that there is insufficient knowledge of the qualitative and quantitative distribution of deep-ocean mineral resources.

The presence of manganese nodules in many areas of the deep sea has triggered industrial interest. The technology to economically recover these nodules does not presently exist. They are the only known minerals of potential value on the deep-sea floor.

It is expected that technology will eventually make feasible the exploitation of mineral resources of the deep-sea bed. When this development occurs, there must be internationally acceptable principles at hand to guide the exploration and exploitation of these resources.

Insofar as is possible, these principles should be compatible not only with the needs of the international community, but with U.S. policy objectives. However, widespread exploitation of deep-sea bed mineral resources is not foreseen for at least a decade. As the exploration of this new environment proceeds, new problems are bound to arise for which internationally acceptable solutions do not exist.

The Department recognizes that the United Nations is a suitable forum for development of international law for use of the oceans' resources. We believe that in the present state of our knowledge of the resource of the deep-sea bed and the problems that may be involved it is premature to consider international control over these resources, and for that reason we do not support the treaty as proposed by Malta.

On the other hand, increased acquisition of knowledge of the deep-sea bed resources is urged, as well as the development of internationally acceptable legal principles for peaceful exploration and exploitation of these resources.

The State Department has indicated that the administration is pursuing a course of action designed to keep open for further study and deliberation the subject of control of deep-ocean resources. Much more needs to be done before definitive action is taken. The State Department has indicated that the enactment of legislation such as House Joint Resolution 816 may not be necessary and we defer to their judgment.

Mr. FASCELL. Thank you, Dr. Cain.

Mr. Terry or Mr. Layton, do you have anything you would like to add to what Dr. Cain has said?

Mr. LAYTON. No, sir.

Mr. TERRY. No, sir.

Mr. FASCELL. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Dr. Cain, it is not clear to me just how the Department goes about issuing leases. On what basis does it decide whether or not to issue a lease? Is it simply a question of an individual

applying, and if there are not competing applications a license is issued?

Dr. CAIN. The business of leasing is run by one of the Department of the Interior bureaus, the Bureau of Land Management, which handles leasing problems on the land as well as on the continental shelf.

When there is sufficient knowledge on Interior's part and when there is sufficient interest on the part of industry, defined tracts are opened for leasing bids. They are competitive bids. The basis is a defined one with competitors differing according to—what is the word I am looking for—the addition to the minimum that they are willing to offer above the established royalty basis, if and when production occurs.

Mr. FRELINGHUYSEN. It is not clear to me what happens. You say when there is sufficient knowledge on the Department's part. Knowledge of what? That there is oil beneath the sea—

Dr. CAIN. Yes. On the basis of knowledge of a geological survey that the Department has and also the probability—because a lot of this involves exploration without assurance—that productive oil wells can be developed. When there is sufficient geological knowledge and sufficient interest on the part of industry, then we see no reason to hold back on exploration.

Mr. FRELINGHUYSEN. There doesn't have to be competition in order to qualify for the issuance of a license? Or does there have to be competition?

Dr. CAIN. I think all the tracts are offered subject to competitive bidding.

Mr. FRELINGHUYSEN. It is open for competition, but it wouldn't be necessary to have competition in order to receive a license, would it?

Dr. CAIN. I believe that is correct. This is not the area of my assistant secretaryship. I said I believe and I know that is not a good answer.

Mr. FRELINGHUYSEN. I didn't mean to press you if it isn't your area.

I notice that you say that a phosphate lease has been granted off the California coast up to a depth of 4,000 feet. How could this be described as the continental shelf?

Dr. CAIN. This is a topographic situation under the water, where the continental shelf has an approximate seaward boundary and within that a deep trench like a canyon or valley. The area of the lease is by no means involving water of great depth. But there is within it a canyon that is deep. Any production probably would come in the more shallow waters.

Mr. FRELINGHUYSEN. The convention allows exploration beyond the shelf as long as there is the technical capacity to develop the resources, doesn't it?

Dr. CAIN. That is correct. In this case I am told that there is no question but what you are within generally recognized shelf areas, but there is a deep trench within them that makes the range of total depths very great.

This is relatively insignificant, I believe. It is not related to the issue of the lease. It is not as if one had gone beyond the 200-meter limit as defining shelf geologically on out to a 4,000-foot depth where the bottom is generally deep.

Mr. FRELINGHUYSEN. Why do we need to worry much one way or another who has title to these deep sea resources, assuming that these

manganese nodules have no great value? It is not like picking up big diamonds, I gather. At that depth it would seem so unlikely that there will be any meaningful economic exploitation that I don't know why we are worrying so much about what kind of sovereignty or control or regime there should be there.

Why do we care? You indicate that there is no likelihood of widespread exploitation of deep seabed mineral resources foreseen for at least a decade. Do you see it after that?

I would think it very unlikely that there is anything of sufficient value, except perhaps oil, at such depths. We seem to have enough to worry about to get an orderly development of the resources on the shelves. Why do we care about the deep sea depths one way or another?

Dr. CAIN. I think the comment on that would be like this—

Mr. FRELINGHUYSEN. Do you think in 20 years there is going to be any widespread exploitation? Will it be economically feasible then in your opinion to have a widespread exploitation of the deep sea depths?

Dr. CAIN. I would like to comment on this line of questioning as follows: We are perhaps in the relationship to the deep ocean in terms of knowledge about like we were at the time of the Louisiana Purchase. We don't know what we have got, as when we acquired Alaska from Russia some years ago.

What we don't know is tremendously impressive to me. And yet the people who know something about marine geology, including some industrial people, see possibilities so that they are looking forward.

The technology, as I stated, does not exist for deep sea mining. But there is a good deal of present development of underwater technology for reasons other than mining, and the next point is our history of a very rapid rate of technological improvements so that things we can do today would seem almost impossible a decade ago.

Looking forward through a period of years there is, let me call it hope, based on our belief in Yankee ingenuity or something like this, that if the values are found to be there the technology to retrieve them will not be far behind.

I believe it is this kind of thing that has given a great many people hope for the future in a vast territory about which we now don't know enough to say positively what the values are.

Mr. FRELINGHUYSEN. Your point is, as I understand it, that we should explore what kind of an asset, or what kinds of assets, we have in the deep sea before we worry about the disposal or sovereignty over them?

Dr. CAIN. No; I think we have the two combined. We are interested, very much interested in acceleration of the exploration.

Mr. FRELINGHUYSEN. When you talk about "we"—

Dr. CAIN. I am talking about the Department of the Interior. We became more and more active in recent times in extending our scientific abilities and our exploration off the continent onto the continental shelf. We are very much interested in this.

We are subsequently interested in going on to a fuller knowledge of the oceans as such, including the deep ocean and the seabed. So the need for knowledge is recognized and we have a great concern to expand this knowledge, so that we know where we are going.

We feel at the same time that because now we don't have the knowledge we have to be very cautious about any commitment as the statement says nationally or internationally as to ownership of these unknown resources.

Mr. FRELINGHUYSEN. Your constant reference to "we" is the Department of the Interior?

Dr. CAIN. Yes.

Mr. FRELINGHUYSEN. Maybe it is a misnomer, if we are talking about resources beyond the continental shelf, to refer to the Department of the Interior. I would think it should be called "Exterior."

Dr. CAIN. I admit it doesn't fit very well. It is an ancient and honorable name. We are the agency concerned with natural resources, including marine.

Mr. FRELINGHUYSEN. You talk about the need for increased acquisition of knowledge about the depths. Do you feel this should be a national responsibility rather than an international responsibility, or it is a combination of the two that you would envisage?

Dr. CAIN. We already participate, we, in this case, being the Department of the Interior, in many open ocean investigations, many of which are worked out cooperatively or compatibly with research of other nations through various kinds of international agreements. So we believe that Interior has a proper role—I know Interior has had a history of strong leadership in research and exploration of the oceans.

Mr. FRELINGHUYSEN. In cooperation with others, do we automatically make available the results of our exploration to other countries?

Dr. CAIN. We do. We have international arrangements. Mr. Terry is a specialist in this field, at least in the living resources of the sea. Perhaps you would like to have him speak about it.

We work in eight international treaty organizations and research is involved in relation to most of them. A good deal of this is done on an international basis and involves the exchange of research data.

Mr. FRELINGHUYSEN. I think, Mr. Chairman, it would be useful if Mr. Terry would supplement what Dr. Cain has been talking about.

Mr. FASCELL. Mr. Terry.

STATEMENT OF WILLIAM M. TERRY, ASSISTANT DIRECTOR, INTERNATIONAL AFFAIRS, BUREAU OF COMMERCIAL FISHERIES, DEPARTMENT OF THE INTERIOR

Mr. TERRY. Mr. Chairman, in the field of living marine resources, that is to say fishery resources, the United States is a party to almost a dozen international agreements ranging from bilateral agreements with Canada to multilateral agreements involving as many as 17 nations, the majority of which have as their objective the investigation of fishery resources which is the object of multinational fisheries.

The end effect of the investigation is to determine the effect of fishing on the resources and looking to the formulation of conservation measures which would prevent overfishing.

When these resources are exploited by fishermen from several nations, the evaluation of research, the interpretation of its results and the formulation, as well as the application, of conservation measures must be an international or multinational thing in order to be effective.

In the North Atlantic, for example, the area running roughly from about the coast of Rhode Island up to the Davis Strait off the west coast of Greenland, there are about 15 nations which fish and which have fished for centuries. There is an international agreement which has been in force there since 1951. The members are the United States and Canada, and in Europe, Iceland, Denmark, Norway, the U.S.S.R., Poland, West Germany, France, the United Kingdom, Spain, Portugal, Italy, Rumania. They all fish in the area. They all are members of this organization.

They all do research. Their research is planned jointly by this organization, the International Commission for the Northwest Atlantic Fisheries. A research target, if you will, is established. The job of reaching the target is parceled out among the 15 members of the organization so we have a coordinated research operation.

The results are all funneled back to the Commission. They become available to all members, the world, for that matter, because the information is all published.

The same thing is true in the North Pacific where we are parties to a trilateral agreement with Japan and Canada. We are parties to a quadrilateral agreement with Japan and Canada and the U.S.S.R. dealing with the resources of the North Pacific, resources which appear on U.S.-owned Pribilof lands and the islands under Soviet control on the other side.

We are parties to an agreement with Mexico, Costa Rica, Panama, and Ecuador, dealing with international American tropical tuna resources in the eastern Pacific Ocean. We have signed and, I believe, recently ratified, a convention dealing with the conservation of Atlantic tuna.

The convention has not entered into force. It was negotiated 2 years ago. Eventually it probably will have, I suppose, 30, 35 members.

The North Atlantic Commission and four or five other similar organizations all are involved in joint research by one means or another. In some cases these international organizations have their own research staffs which are supported by contributions from the governments. In other cases, as in the North Atlantic, their function is essentially one of planning and then coordinating research done by national research agencies. In either case this is truly international research, the results of which become available to all of the parties, and indeed to the world at large.

In addition, also in the fishery field, we do a fair amount of what I think has to be called international research not within the framework of a formal international agreement, but informal cooperation in international research. At the moment we are involved in a major oceanographic investigation on the eastern Pacific ranging from northern Chile to the United States-Canadian border with several agencies in the United States, Mexico, Peru, Chile, Ecuador, all co-operating in the ocean aspects of this investigation. The results of this investigation will be made available to all of the cooperators and to the rest of the world.

I think this gives an idea, Mr. Chairman, of the kinds of things we are already deeply involved in and have been involved in for many years.

Mr. FRELINGHUYSEN. Do we have the same kind of cooperation in the field of mineral research or oil that we have for fisheries?

Dr. CAIN. Not to my knowledge. I can give you some examples that come close to general oceanography, not just fisheries. We are involved in the International Hydrologic Decade, which is underway.

Mr. FASCELL. What is that, Dr. Cain?

Dr. CAIN. It is a decade of international cooperative effort to learn more about the conditions of water both on the land and in the ocean.

Mr. FRELINGHUYSEN. Is this sponsored by the United Nations and when did the decade begin?

Dr. CAIN. The International Hydrologic Decade which began in 1965, is sponsored by the International Council of Scientific Unions. This is nongovernmental. Scientific unions are international bodies made up of national societies that have a similar interest. So this is the largest umbrella for strictly nongovernmental work.

Another example is the International Biological Program which is just getting underway. There are now nearly four dozen nations that have formal programs that are coordinated under international planning. One of the sections of the International Biological Program is on the marine situation.

We participate with several nations in the Indian Ocean program. It did physical and biological oceanography. It dealt with the conditions of the seabed and so on.

We are also working internationally in Antarctica. Some of this is cooperative work. We have had exchange of scientific personnel with vessels of other nations. We now have a joint research program involving the two *Albatross* vessels, one U.S.S.R. and United States, which are doing oceanographic research right at this moment.

I think the point is, we are already deeply involved in international research, a good deal of which is related to the oceans.

Specifically, I know of no program being carried on at the moment with respect to the minerals of the deep seabed. There is a proposal for a continental shelf study in the Bering Sea.

Mr. FRELINGHUYSEN. It is not clear to me why there is not more interest if there is anything of real value in the depths. Also, why isn't there already international cooperation to see if there are minerals that would be feasible to extract.

I suppose the answer is obvious. Possibly there are such tremendous potential assets in the shelves that there is more than enough room to explore and exploit in that area without worrying too much about what goes on in the depths or what might be available in the depths.

Dr. CAIN. You are certainly right that we know more about the continental shelf and particularly the near shore part of the continental shelf, and the exploration and development of that has been extremely productive. This is where most of the investment in manpower, in research and the investment of funds in development will occur in the near future. Because this is so productive, people are looking further out.

Mr. FRELINGHUYSEN. Do you foresee national competition, competing national plans, on the shelf and the need for some kind of international effort to prevent such clashes?

Dr. CAIN. I think the situation has been greatly clarified with respect to the continental shelf, except for the definition of outer margin, because although the superambient waters are limited to territorial waters or limited agreements beyond 3 or 12 or whatever the mileage is, that the seabed itself is subject to national interest out to this defined limit of 200 meters.

But you see this other clause that says greater depths of technology permits the exploitation. This is where it gets fuzzy. So far as the continental shelf contiguous to a nation, the only problem is the normal problem of a boundary line between two nations. I think that, without having this issue become half surfaced, it would be a projection of the existing boundary by some agreement between the two nations.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. FASCELL. Dr. Cain, Dr. Chapman, director of the Division of Resources of Van Camp Sea Food Division of Ralston-Purina, and who is chairman of the Panel on Law of the Sea of the National Academy of Sciences, in an article in "Oceanology International" of May-June 1967, has recently asserted that policies followed by the United States have led to a steady erosion of the 3-mile territorial limit toward the 12-mile limit, and he claims this is precisely what our commercial, diplomatic, and military interests are trying desperately to avoid.

Do you have any comment on that?

We will insert that article in the record, if there is no objection.

(The article referred to follows:)

WHO OWNS THE SEA?

AS OUR USE OF THE SEA AND ITS RESOURCES INCREASES, THE LEGAL PROBLEMS MULTIPLY—AND MAY SOON GET OUT OF HAND

(By Dr. Wilbert McLeod Chapman, Director, Div. of Resources, Van Camp Sea Food Div., Ralston-Purina Co.)

In September 1945, President Harry S. Truman made two proclamations dealing with the law of the sea. One was concerned with extending jurisdiction by the United States over the resources of the continental shelf adjacent to its coasts. The other dealt with the possibility of establishing zones on the high seas off the coast that would aid in obtaining proper conservation of offshore fishery resources.

These two proclamations resulted in a considerable excitation of diplomatic and legal activity. This led in many directions that U. S. policy did not want to go. Other nations made much broader claims, basing their proclamations on the action taken by the United States, and either blandly misinterpreting what the U. S. had claimed, or simply contending that one sovereign had as much right to stake a claim in the international domain as had another.

Rather vigorous legal and diplomatic action ensued over these issues in the Organization of American States and the United Nations, as well as between and among nations, from 1945 to 1958.

A Conference of Plenipotentiaries was convened by the UN in Geneva in 1958. This conference brought the controversies to a temporary pause by codifying and extending the law of the sea in four conventions that were opened for ratification:

Convention on the High Seas.

Convention on the Territorial Sea & Contiguous Zone.

Convention on Fishing and the Conservation of the Living Resources of the High Seas.

Convention on the continental shelf.

All four of the conventions have received the necessary number of ratifications and now are in force. The United States is a party to all four.

There were two main points upon which the 1958 conference could not reach agreement—the breadth of the territorial sea and the jurisdiction by coastal states over fisheries in the high seas off their coast.

Another conference was convened by the UN, again in Geneva, in 1960, solely to resolve these two remaining problems. But, again, agreement was not reached.

Legal ramifications

The various conferences and activities resulted in different bodies of law with which to deal with problems in the atmosphere above the ocean, the sea floor, and the ocean itself.

There was not, and is not, much controversy over the law applying to the lower atmosphere. Essentially all nations have the right to overfly the high

seas and no right to overfly the territorial sea, inland waters, or land territory of another nation without its permission. Activity in space in recent years has modified this on the top side of the atmosphere, but that does not concern us here, as it bears no close relationship to the law of the sea.

The regime applying to the sea floor extended the exclusive jurisdiction, for both exploration and exploitation, of the coastal state out over the resources of the adjacent continental shelf without affecting the character of the superjacent waters as high seas. There was little controversy attached to this progressive step in the development of international law.

Three problems were not resolved to the satisfaction of all.

Which biological resources pertain to the continental shelf and which to the superjacent waters?

What are the rights of foreign scientists to investigate the resources of the continental shelf?

What is the outer limit of the continental shelf?

The first question was resolved by defining the biological resources that pertain to the continental shelf as "living organisms belonging to sedentary species; that is to say, organisms which at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil."

King crab agreement

This rather clever definition has resulted in only one interaction among nations that I know of, and that is the question of whether the king crab of the North Pacific are in constant physical contact with the seabed in their harvestable stage. The U.S. and Russia agree that they are.

Japan does not agree but has adjusted its king crab fishery on Russian and American continental shelves on a voluntary basis, anyway, to keep the peace.

The second point was resolved by the following language: "The consent of the coastal state shall be obtained in respect of any research concerning the continental shelf and undertaken there. Nevertheless, the coastal state shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal state shall have the right, if it so desires, to participate or to be represented in the research, and that in any event the results shall be published."

This decision was widely disliked by scientists, particularly in the U.S., but was not controversial among sovereign states. I know of no international dispute that has arisen from it.

Taking food from the shelf

The third point was resolved by defining the continental shelf as follows: "The term 'continental shelf' is used as referring to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the same areas."

Not only was there no serious disagreement over this definition among the nations at the 1958 conference, but it was adopted almost verbatim from the recommendation made by the International Law Commission on the rationale that the commission had adopted.

Although no disputes have arisen among nations over this definition, hardly any phase of the four conventions has elicited so much debate among private citizens from the academic and industrial communities, particularly in the U.S. One cannot help doubting that these debaters have read the clear commentary of the International Law Commission on this particular point.

Two separate disputes respecting the liquid ocean became indescribably intermixed during both law-of-the-sea conferences. They remain so, and still are resulting in interaction of a less than peaceful nature among nations.

The first dispute arises from causes that are primarily military and mercantile. If the territorial sea is 3 miles in breadth, all international straits that have existed for the past century or so remain open to passage by any flag vessel without the consent of the sovereign of the adjacent coasts, and they can be overflown as high seas.

A 12-mile breadth for the territorial sea would remove international status from many straits most important to navigation in the Caribbean, Southeast Asia, and elsewhere, as well as removing an area of more than 7,700,000 sq km (3-million square miles) from the high seas. The military consequences of such a change would be so great that this aspect dominated the interaction on this point through both conferences.

The second dispute deals with the right of a coastal state to exercise jurisdiction over fisheries adjacent to its coast. Broadly speaking, all fishermen (and their sovereigns) wish the right to fish everywhere without restrictions, but they do not want their competitors to have the same right. Two natural circumstances help to fog the dispute.

Danger of overfishing

The first is that each stock of fish is capable of being overfished, to the detriment of all. In numerous instances, unregulated fishing effort has had this effect. Accordingly, to preserve stocks to the benefit of all, fishing effort on any species must be regulated so that it will not exceed that level corresponding to the maximum sustainable yield.

Secondly, the living resources of the sea are migratory. They move across boundaries according to their biological needs and not by the desires of man. No boundaries in the sea can describe their multitudinous and diverse migratory patterns, and fishes cannot thrive and multiply without this freedom of movement.

The first of these natural circumstances yields two practical problems—conservation, and the division of the profits arising from conservation. The matter of conservation was rationalized in the Convention on Fishing & the Conservation of the Living Resources of the High Seas by providing a mechanism for dealing with the conservation of fish stocks through international agreements, and a mechanism for resolving disputes.

This took care of part of the problem. But it left the second part—the division of profits arising from conservation practices among the nations—to separate *ad hoc* agreements among them, as it had been formerly, for the plain reason that no universal solution had been reached beyond the phrase “reasonable use.”

One way that a nation can resolve the problem selfishly is to extend its exclusive jurisdiction to exclude foreign fishermen from the use of the resources found there. The weaker fishing countries always have tried to do this—from the Middle Ages to the present time. Strong fishing nations have, at the same time, resisted these efforts.

The U.S. has been, and is, on the sharp horns of this dilemma. As a strong sea power, it wishes to keep the high seas as broad as possible in order to exercise its power with maximum flexibility. It is a weak fishing power, however, and the weak elements of its fishing industry continually press it to extend its jurisdiction farther to sea to reduce competition from foreign fishermen.

Trading fish for security

Obviously, military security must supervene. During the 1958 and 1960 conferences on the law of the sea, the U.S. exercised the stratagem of trading fishery rights when necessary to win votes for a narrow territorial sea.

But other nations, and particularly small ones among its military allies, have great need for access to the food of the sea and assumed that the U.S. would protect them militarily but not necessarily commercially.

Accordingly, the military and the fishing interests in territorial limits, and in jurisdiction over fishing in the high seas, become so confused that it was impossible to give enough fish away to win the votes required to resolve the military problem.

The 1960 conference gave some pause to these disputes as adjustment in international practice was made by the nations to a formula that had been proposed by the U.S. and had won nearly enough votes. This formula envisioned a territorial sea 3 to 6 miles wide, plus enough extra fishery jurisdiction to allow exclusive fishing rights in a zone extending 12 miles offshore.

The diplomatic and military establishments of the U.S. government never have understood why the fishery and territorial sea issues could not be dealt with separately. The sea fisheries are not an important part of U.S. economy, but military security is. It is not understood that in other nations having a vote in the UN these interests are in closer balance.

Accordingly, the policies followed by the U.S. in the law-of-the-sea conferences have led to a steady erosion of the 3-mile territorial sea toward the 12-mile limit, which was just what the diplomatic and military establishments wished to avoid.

To all intents and purposes, the U.S. has lost this key battle, although the argument will persist. The Navy has enough firepower to reverse the decision, but the government will not let it pull the trigger.

The whole subject has been brought to white heat again in the international field by two actions again instituted by the United States.

The first of these was the passage in 1966 of legislation establishing a 12-mile fishing limit for the U.S. As was anticipated, this has led to an increase in the number of nations making similar claims; also to a further erosion of the 3-mile territorial sea to the 12-mile limit by other nations (for instance, Nigeria and Mauretania, recently); and to an expansion of claims to even broader territorial limits—up to 200 miles in some cases—together with enhanced activities to enforce them.

The second action was the adoption by the UN General Assembly, on Dec. 8, 1966, of a U.S.-sponsored resolution concerning the resources of the sea. This resolution set up procedures for making an international survey of everything that is now being done with respect to the utilization of ocean resources.

It also requires the Secretary-General of the UN to formulate proposals for ensuring the most effective arrangement for expanded programs and international cooperation in reaching a better understanding of the marine environment. This would be accomplished through research and the exploitation of marine resources, with due regard to the conservation of fish stocks.

In view of the resolution, we must now re-examine the whole subject of how ocean resources are to be utilized. Regarding the jurisdiction of nations, we now have three possibilities:

Divide the ocean into numerous national lakes.

Turn the entire high seas over to the UN to lease out and make revenue from.

Preserve the status quo.

Obviously, the Pandora's box of the law and mastery of the sea has been opened to a greater extent than even President Truman was able to do in 1945.

Just who in the U.S. government has visualized the international consequence of these recent actions on the posture and general interests of the U.S., and the world, is a puzzle.

It is to be hoped that the Vice President and his National Council on Marine Resources & Engineering Development might take these matters under review before we lose access to the ocean and its resources to a degree for which our grandchildren will suffer.

Dr. CAIN. A rather longtime international understanding of the 3-mile limit is quite correct. It is being eroded away by unilateral action of nations. There must be somewhere in the order of 15 or 20 nations that already have moved to the 12-mile limit and have done so, most of them, in advance of any action by the United States.

There must be at least 15 different kinds of unilateral national claims to the outer limits of territorial water now in existence. I can provide the statistics and identify the nations if you would like them.

Mr. FASCELL. We would appreciate your supplying that information for the record.

Dr. CAIN. The move is clearly in the direction of extending territorial waters beyond the 3-mile limit. This is related to security and it is related to the developable natural resources.

Mr. FASCELL. As you said, many countries took action prior to the United States. Our action was in 1966, wasn't it?

Dr. CAIN. Yes, sir.

Mr. FASCELL. Was ours restricted to fishing?

Dr. CAIN. Between the 3- and the 12-mile limit it was restricted to fishing.

Mr. FASCELL. That was the extent of our claim of jurisdiction?

Dr. CAIN. That is correct.

(The following information was subsequently provided:)

BREADTH OF TERRITORIAL SEA AND FISHING JURISDICTION CLAIMED BY MEMBERS OF THE UNITED NATIONS SYSTEM

The following information is based on the synoptical tables concerning the breadth and juridical status of the territorial sea and adjacent zones prepared

for the 1958 and 1960 Geneva Law of the Sea Conferences, and additional information available to the Department of State (April 1, 1967).

AFRICA

Country	Territorial sea	Fishing limits	Other
Algeria	12 miles	12 miles	
Botswana	No coast		
Burundi	do		
Cameroon	6 miles	6 miles	
Central African Republic	No coast		
Chad	do		
Congo (Brazzaville)	Not available		
Congo (Kinshasa)	do		
Dahomey	3 miles	12 miles	May also apply to territorial sea.
Ethiopia	12 miles	do	
Gabon	do	do	
Ghana	do	do	Undefined protective areas may be proclaimed seaward of territorial sea and up to 100 miles seaward of territorial sea may be proclaimed fishing conservation zone.
Guinea	130 miles	130 miles	
Ivory Coast	3 miles	3 miles	
Kenya	do	do	
Lesotho	No coast		
Liberia	3 miles	3 miles	
Libya	12 miles	12 miles	
Malagasy Republic	do	do	
Malawi	No coast		
Mali	do		
Mauritania	6 miles	12 miles	
Morocco	3 miles	do	Exception, 6 miles for Strait of Gibraltar.
Niger	No coast		
Nigeria	12 miles	12 miles	
Rwanda	No coast		
Senegal	6 miles	6 miles	Plus 6 miles contiguous zone.
Sierra Leone	12 miles	12 miles	
Somali Republic	do	do	
South Africa	6 miles	do	
Sudan	12 miles	do	
Tanzania	do	do	
The Gambia	3 miles	3 miles	
Togo	12 miles	12 miles	
Tunisia	6 miles	do	Territorial sea follows the 50-meter isobath for part of the coast (maximum 65 miles).
Uganda	No coast		
United Arab Republic	12 miles	12 miles	
Upper Volta	No coast		
Zambia	do		

EAST ASIA AND PACIFIC

Australia	3 miles	Decision announced for 12 miles fishery limits.	
Burma	12 miles	12 miles	
Cambodia	5 miles	do	Continental Shelf to 50 meters including sovereignty over superjacent waters.
China	3 miles	3 miles	
Indonesia	12 miles	12 miles	
Japan	3 miles	3 miles	
Korea	Not available	20 to 200 miles	Continental Shelf including sovereignty over superjacent waters.
Laos	No coast		
Malaysia	3 miles	3 miles	
Mongolia	No coast		
New Zealand	3 miles	12 miles	
Philippines			Waters within straight lines joining appropriate points of outermost islands of the archipelago are considered internal waters; waters between these baselines and the limits described in the Treaty of Paris, Dec. 10, 1898, the United States-Spain treaty of Nov. 7, 1900, and United States-United Kingdom treaty of Jan. 2, 1930, are considered to be the territorial sea.
Singapore	Not available		
Thailand	12 miles	12 miles	
Vietnam	Not available	20 kilometers	(10.8 miles.)

EUROPE

Country	Territorial sea	Fishing limits	Other
Albania.....	10 miles.....	12 miles.....	
Austria.....	No coast.....		
Belgium.....	3 miles.....	12 miles ¹	
Bulgaria.....	12 miles.....	do. ¹	
Byelorussian S.S.R.....	No coast.....		
Czechoslovakia.....	do.....		
Denmark.....	3 miles.....	12 miles ¹	
Greenland.....		do.....	
Faroe Islands.....		do.....	
Federal Republic of Germany.....	3 miles.....	(?).....	
Finland.....	4 miles.....	4 miles.....	
France.....	3 miles.....	12 miles ¹	
Greece.....	6 miles.....	6 miles.....	
Holy See.....	No coast.....		
Hungary.....	do.....		
Iceland.....	Not available.....	12 miles.....	
Ireland.....	3 miles.....	do. ¹	
Italy.....	6 miles.....	do. ¹	
Luxembourg.....	No coast.....	(?).....	
Malta.....	3 miles.....	3 miles.....	
Netherlands.....	do.....	(?).....	
Norway.....	4 miles.....	12 miles.....	
Poland.....	3 miles.....	3 miles.....	
Portugal.....	No claims.....	12 miles ¹	
Rumania.....	12 miles.....	do.....	
Spain.....	6 miles.....	do. ¹	
Sweden.....	4 miles.....	do. ¹	
Switzerland.....	No coast.....		
Ukrainian S.S.R.....	12 miles.....	12 miles.....	
U.S.S.R.....	do.....	do.....	
United Kingdom.....	3 miles.....	do. ¹	
Overseas areas.....	do.....	3 miles.....	
Yugoslavia.....	10 miles.....	10 miles.....	

NORTH AMERICA

Canada.....	3 miles.....	12 miles.....
United States.....	do.....	do.....

SOUTH AND CENTRAL AMERICA AND CARIBBEAN

Argentina.....	200 miles.....	200 miles.....	Continental Shelf including sovereignty over superjacent waters.
Barbados.....	Not available.....		
Bolivia.....	No coast.....		
Brazil.....	6 miles.....	12 miles.....	
Chile.....	50 kilometers.....	200 miles.....	
Colombia.....	6 miles.....	12 miles.....	
Costa Rica.....	3 miles.....		"Specialized competence" over living resources to 200 miles.
Cuba.....	do.....	3 miles.....	
Dominican Republic.....	do.....	15 miles.....	
Ecuador.....	200 miles.....	200 miles.....	
El Salvador.....	do.....	do.....	
Guatemala.....	12 miles.....	12 miles.....	
Guyana.....	Not available.....		
Haiti.....	6 miles.....	6 miles.....	
Honduras.....	12 miles.....	12 miles.....	
Jamaica.....	3 miles.....	Decision announced for 12 miles territorial sea.	
Mexico.....	9 miles.....	12 miles.....	
Nicaragua.....	3 miles.....	200 miles.....	Continental Shelf including sovereignty over superjacent waters.
Panama.....	200 miles.....	do.....	Do.
Paraguay.....	No coast.....		
Peru.....	200 miles.....	200 miles.....	
Trinidad and Tobago.....	3 miles.....	3 miles.....	
Uruguay.....	6 miles.....	12 miles.....	
Venezuela.....	12 miles.....	do.....	

SOUTH ASIA AND NEAR EAST

Country	Territorial sea	Fishing limits	Other
Afghanistan.....	No coast.....	
Ceylon.....	6 miles.....	6 miles.....	Claims right to establish conservation zones within 100 nautical miles of the territorial sea.
Cyprus.....	12 miles.....	12 miles.....	
India.....	6 miles.....	100 miles.....	
Iran.....	12 miles.....	12 miles.....	
Iraq.....	do.....	do.....	
Israel.....	6 miles.....	6 miles.....	
Jordan.....	3 miles.....	3 miles.....	
Kuwait.....	Not available.....	
Lebanon.....	do.....	6 miles.....	
Maldiv Islands.....	do.....	do.....	
Nepal.....	No coast.....	
Pakistan.....	12 miles.....	12 miles.....	Plus right to establish 100-mile conservation zones.
Saudi Arabia.....	do.....	do.....	
Syria.....	do.....	do.....	Plus 6 miles "necessary supervision zone."
Turkey.....	6 miles.....	do.....	
Yemen.....	No claims.....	

¹ Parties to the European Fisheries Convention which provides for the right to establish 3 miles exclusive fishing zone seaward of 3-mile territorial sea plus additional 6-mile fishing zone restricted to the convention nations.

² Signatories of the European Fisheries Convention.

Mr. FASCELL. We tried to hold on to the best of both concepts, as I see it, is that right?

Dr. CAIN. Even within that where there had been traditional fishing in the area between 3 and 9 miles we have reached certain agreements for part of that to continue.

Mr. FASCELL. Dr. Chapman went on to say—and I would like to get your comment on this—that this erosion of the 3-mile territorial sea toward a 12-mile limit by the U.S. action and action of other nations, the resolution adopted in the U.N. for a study of the resources of the sea, and the more recent Malta proposal, have brought all of this to a head. He says in view thereof we must now reexamine the whole subject of how ocean resources are to be utilized, and that regarding the jurisdiction of nations, there are now three possibilities:

First, to divide the ocean into numerous national lakes;

Second, to turn the entire high seas over to the U.N. to lease out and make revenue from; or

Third, preserve the status quo.

Dr. CAIN. The questions that Dr. Chapman raised have been under consideration. There is a committee of the National Marine Council, the chairmanship of which is with the State Department. The committee deals with the matter of international policy in the marine sciences. They have been studying this. They have background papers that have been prepared on this.

The position that State has come up with, which I referred to with respect to the Malta proposal, and in which we concur, is that it is entirely premature to enter into any negotiation at the moment to try to settle such questions as this.

I suppose in a sense what we are at now is maintenance of the status quo, while we learn more about the nature of the seabed and the value of the resources and the possibility of utilizing them. On the basis of

this we would be in a rational position to know how to defend U.S. interests in whatever forum we find ourselves.

Mr. FINDLEY. Dr. Cain, can you tell me if any nation has in recent years attempted to establish its authority over the seabed beyond the 12-mile limit?

Dr. CAIN. The authority over the seabed by the Geneva agreement worked out in 1958 gives a nation control over its contiguous continental shelf to the defined depth of 200 meters.

Mr. FINDLEY. Beyond that 200-meter limit has any nation tried to establish—

Dr. CAIN. Then it gets a little fuzzy because it says if deeper technology permits. In other words, in the Geneva Conference they found it impossible to settle the very question you have raised. It is still open.

Mr. FINDLEY. No nation to your knowledge has attempted to establish authority beyond that 200—

Dr. CAIN. Beyond the continental shelf, none that I know of.

Mr. FASCELL. Hasn't the United States in effect established a claim in one way or another—at least it could be interpreted that way—beyond the 200-meter line?

Dr. CAIN. Mr. Terry has pointed out where we have issued oil leases or phosphorus leases, or whatever, at a greater depth than the 200 meters, the one case I think I explained because it was clearly continental shelf although it had deepwater places within it.

Actually, as to the actual geographic situation where oil leases have been issued in a thousand feet of water, I don't know where that is.

Mr. FASCELL. Would you provide that for the record, because we have an obviously interesting problem confronting us with respect to the definition under the international convention of what the U.S. position would be. If the United States has taken a position which amounts to a definition of the ambiguity that exists under the international convention, then obviously other countries will take similar or conflicting positions.

Since the language is subject to interpretation and definition, one of the important factors in an ultimate redefinition will be what the United States has done, if anything, in the meantime. One of such actions could be whether or not we have actually granted leases beyond the continental shelf.

Dr. CAIN. We will do that.

(The information requested follows:)

DEPARTMENT OF THE INTERIOR LEASES FOR DEPTHS OF MORE THAN 200 METERS

LEASES (5,760 ACRES AREA) ISSUED AT GREATER DEPTH THAN 200 METERS

Off the coast of Northern Oregon—to Shell Oil Company, issued December 1, 1964 with a 5-year primary term, for oil and gas exploration and exploitation:

P-065—30 miles from shore in about 1,500' of water

P-066—32 miles from shore in about 1,500' of water

P-067—32 miles from shore in about 1,500' of water

Off the coast of Northern California—to Shell Oil Company, issued July 1, 1963, no longer active, for oil and gas exploration and exploitation:

P-022—12 miles from shore in about 500–1,100' of water

P-023—15 miles from shore in about 1,200' of water

SUMMARY OF OPINION OF THE OFFICE OF THE SOLICITOR,
DEPARTMENT OF THE INTERIOR

MAY 5, 1961.

APPLICATION OF OUTER CONTINENTAL SHELF LANDS ACT TO DESIGNATED AREA
OFF THE COAST OF CALIFORNIA

Outer Continental Shelf Lands Act: Generally

The applicability of the Outer Continental Shelf Lands Act extends to all submerged areas lying seaward of the States' boundaries over the seabed and subsoil of which the United States has asserted jurisdiction. Since the United States has now asserted jurisdiction over the seabed and subsoil of the submarine areas adjacent to the coast of the mainland and islands as far as the depth of the superjacent waters permits exploitation of the natural resources, the Act is now applicable to those areas.

U.S. DEPARTMENT OF THE INTERIOR.
OFFICE OF THE SOLICITOR,
Washington, D.C., May 5, 1961.

MEMORANDUM

To: Director, Bureau of Land Management.

From: Associate Solicitor, Division of Public Lands.

Subject: Application of Outer Continental Shelf Lands Act to designated area off the coast of California.

This is in reply to your memorandum of April 13, 1961, inquiring whether phosphate deposits in a designated area off the coast of southern California may be leased under the Outer Continental Shelf Lands Act (67 Stat. 462; 43 U.S.C. secs. 1331-1343).

The designated area lies some forty miles off the coast of southern California. While it lies closer to the mainland than San Clemente Island, the designated area does not lie between that island and the mainland but rather in the open sea. The soundings in the designated area range between 43 and 670 fathoms, the greater part of the area being at a depth of far more than 100 fathoms. Between the designated area and the mainland lies a deep channel in which the soundings are of 600 fathoms and more.

The question of the propriety of leasing phosphate deposits in this area under the Outer Continental Shelf Lands Act has been presented to us because it has been frequently said in the past that the continental shelf extends seaward to a point where the water deepens rapidly and that this outer limit is set at the 100-fathom line. Under such a definition the designated areas would lie beyond the outer Continental Shelf, and, consequently, the crux of this problem is whether there is in fact a seaward limit to the applicability of the Outer Continental Shelf Lands Act set at the 100-fathom line. The distance of 40 miles from the mainland is of little importance since in the Gulf of Mexico activities under the Act are conducted at a greater distance; there, however, the depth of the water increases very slowly.

The question presented is rather novel. Previous questions as to the applicability of the Outer Continental Shelf Lands Act have concerned the landward limits of the outer Continental Shelf and the disputes between the States and the Federal Government as to boundaries. The question here is not similar because there is no other party to assert jurisdiction over the seabed and subsoil of this area if the United States should fail to do so.

The definition of the "Outer Continental Shelf" in section 2(a) of the Act (43 U.S.C., sec. 1331(a)) is silent as to how far in a seaward direction the continental shelf extends. The definition merely states:

"(a) The term 'outer Continental Shelf' means all submerged lands lying seaward and outside of the area of lands beneath navigable waters as defined in section 2 of the Submerged Lands Act (Public Law 31, Eighty-third Congress, first session), and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control."

It should be noted that section 2(a) defines the shelf in terms of the subsoil and seabed under the jurisdiction and control of the United States, while section

3(a) (43 U.S.C., sec. 1332(a)) declares that the subsoil and seabed of the "the outer Continental Shelf appertain to the United States and are subject to its jurisdiction, control and power of disposition * * *." Thus the term "outer Continental Shelf" appears to be used in the Act not as a geographic term generally understood by geographers but as having been given a special statutory definition in order that it may apply to all submerged lands over which the United States has asserted jurisdiction and control seaward of the boundaries of the States.

While the statute is silent as to the seaward limits of the continental shelf, the legislative history is vague. It, unlike the statute, does contain a description of the continental shelf as it is regarded by geographers. However, as we have pointed out above, the statute does not employ the term as it is ordinarily used by geographers, but employs it rather as describing all the submerged lands seaward of the States' boundaries over which the United States asserts jurisdiction and control. Consequently, any description in the legislative history of the continental shelf as a geographic concept may be regarded as an effort to give the Congress a general idea of the area over which the United States was asserting jurisdiction rather than a precise definition applicable to the statute. The Senate Interior Committee report on S. 1901, 83d Congress, states (S. Rep. No. 411, 83d Cong., 1st Sess., page 4) :

"The Continental Shelf is defined as the extensions of the land mass of the continents out under the waters of the ocean to the point where the continental slope leading to the true ocean bottom begins. This point is generally regarded as a depth of approximately 100 fathoms, or 600 feet, more or less. In countries using the metric system, the outer limit of the shelf is generally regarded as a depth of 200 meters, which is approximately the same as the 100-fathoms mark adopted by England and America.

"In his testimony in 1949 before the Senate Interior and Insular Affairs Committee, the former Secretary of the Interior gave the following description of the Continental Shelf :

"These lands begin at the low-water mark along the open sea, or at the seaward boundary of inland waters—such as bays, ports, and the mouths of rivers—and extend seaward for varying distances at different places.

"The Continental Shelves are slightly submerged portions of the continents that surround all the continental areas of the earth. Along some portions of the coasts they are very broad, gently sloping platforms; and at other places they are narrow. The outer boundary of each shelf is marked by an increase in the gradient of slope of the sea floor. This occurs generally at a depth of approximately 100 fathoms, or 600 feet. Beyond the 100-fathom line, the outer slopes or the Continental Shelves are inclined more steeply toward the ocean deeps.

"Along the Atlantic coast and in the Gulf of Mexico the Continental Shelves are generally very broad. Off the New England coast, where the width is greatest, the shelf extends seaward about 250 miles. Elsewhere along the Atlantic coast it ranges in width from about 40 to about 100 miles except for a relatively narrow strip along the east coast of Florida. In the Gulf of Mexico the average width of the broad shelf off the west coast of Florida is about 150 miles, and elsewhere in the Gulf the shelf is from 40 to 150 miles wide except where the land area formed by the Delta of the Mississippi River has been extended across the shelf almost to its outer edge.

"Off the Pacific Coast States the Continental Shelf is relatively narrow, ranging in width from 5 miles or less to a maximum of about 40 miles."

Why the 100-fathom line was generally accepted as the seaward limit is not explained in the report except as set forth in the former Secretary's testimony.

The first action by the United States Government with respect to the continental shelf was the issuance by President Truman of a Proclamation (No. 2667) on September 28, 1945 (59 Stat. 884). That proclamation declared that the United States regarded the natural resources of the subsoil and seabed of the continental shelf beneath the seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control. As justification for the proclamation, it was stated that "with modern technological progress" the utilization of those natural resources "is already practicable or will become so at an early date." Nowhere in the proclamation is there any mention of the seaward limits of the continental shelf. The press release which accompanied the proclamation (printed at page 53 of the Senate report, *supra*) did state :

"Generally, submerged land which is contiguous to the continent and which is covered by no more than 100 fathoms (600 feet) of water is considered as the continental shelf."

However, the last paragraph of the press release (at page 54) emphasized the importance of technology in determining the seaward limits of exploitation as follows:

"The advance of technology prior to the present war had already made possible the exploitation of a limited amount of minerals from submerged lands within the 3-mile limit. The rapid development of technical knowledge and equipment occasioned by the war, now makes possible the determination of the resources of the submerged lands outside of the 3-mile limit. With the need for the discovery of additional resources of petroleum and other minerals it became advisable for the United States to make possible orderly development of these resources. The proclamation of the President is designed to serve this purpose."

It is thus clear that at the time when the Outer Continental Shelf Lands Act was passed the Congress did not contemplate the immediate development of areas beyond the 100-fathom line. The reason that such development was not contemplated was apparently the existing technological inability to develop resources at such great depths. Nevertheless, the Congress did not prescribe a limit on the depth of water beneath which the subsoil and seabed appertain to the United States and may be developed under the act. Without such a seaward limit it is possible to hold that with technological progress the act may be applied to areas at greater and greater depths.

The Senate Report also refers to the shelf as extending to a point where the gradient of the decline of the sea floor has a marked increase and where the slope to the true ocean floor begins. Language to this effect is also found in footnote 3 of *United States v. Louisiana*, 363 U.S. 1 (1960). The determination of such a point presents difficulty and would require the careful study of experts in this field. We do not presume to be competent to determine this point. However, we note that the sea floor in this general area does not slope steadily to the true ocean floor. Instead it is cut up with channels, ridges, and plateaus. This does not, therefore, appear a satisfactory test of the seaward limit of the continental shelf. It is not required by the statute, and was abandoned in the definition of the continental shelf recently adopted by the United States.

On May 26, 1960, the Senate ratified the "Convention on the Continental Shelf" (106 Cong. Rec. 10374; daily ed. May 26, 1960). That Convention has not, we understand, yet come into effect, but it may be regarded as expressing the present views of the United States on the continental shelf. Article one of that Convention is as follows:

"For the purpose of these articles, the term 'continental shelf' is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands."

This is the first definition of "continental shelf" officially adopted by the United States which sets any seaward limit. Though it is not an amendment of the Outer Continental Shelf Lands Act, it is an indication of the extent of the area of seabed and subsoil over which the United States asserts jurisdiction, control, and power of disposition. As we have pointed out above, the Act is applicable to all submerged lands seaward of the States' boundaries of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control. Since the United States has now asserted rights to the seabed and subsoil as far seaward as exploitation is possible, it is clear that the Outer Continental Shelf Lands Act is now applicable to all these areas. There is no question that the area designated on the map which you have sent us falls within the scope of the definition in the Convention and is, therefore, subject to leasing under the Act.

It is difficult to see how a case or controversy concerning our interpretation of the applicability of the statute will arise under the present circumstances. If the applicant had proceeded to develop these phosphate deposits without regard to the Outer Continental Shelf Lands Act, we could have objected, and on our assertion of the applicability of the Act the question could have been settled judicially. However, here the company has applied for a lease under the Act

and we are aware of no party withstanding to object to the granting of such a lease.

We agree with Mr. Caplan, in his memorandum of April 13, that there appears to be no reason to regard this area as within Mexican jurisdiction.

THOMAS J. CAVANAUGH,
Associate Solicitor, Division of Public Lands.

Mr. FASCELL. Let me get some other matters on the record.

What offices or bureaus of the Department of the Interior are involved in issues relating to jurisdiction over ocean resources?

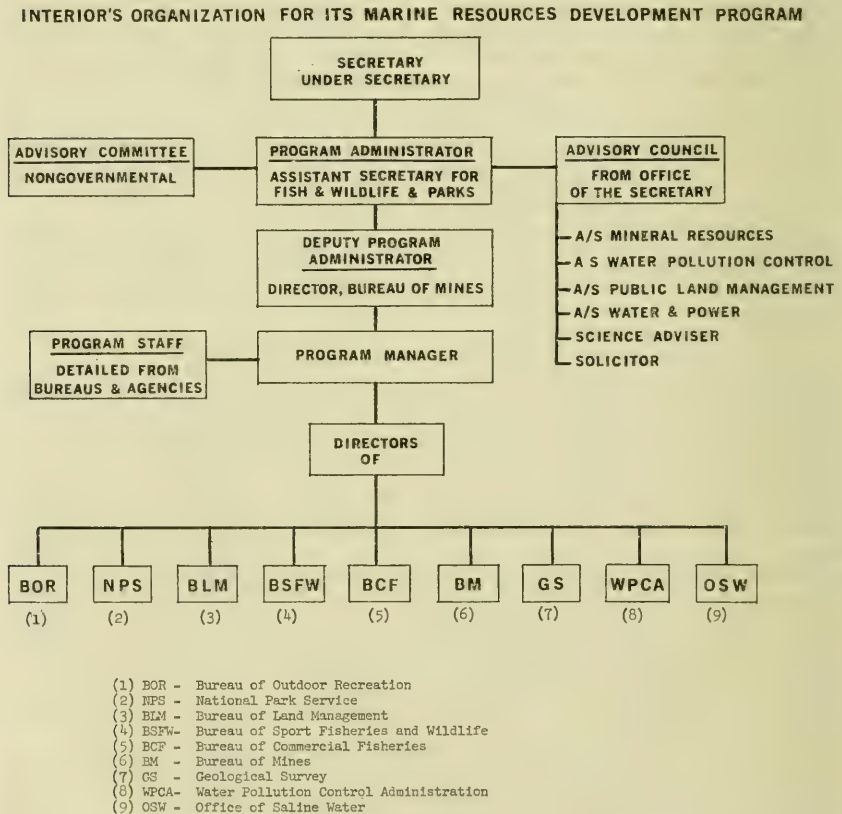
Dr. CAIN. There are nine bureaus in Interior out of 23, I believe it is, that have some responsibility in the oceans. I have a chart that shows you the structure of Interior if you would like to see it.

Mr. FASCELL. If you will identify for the record the nine bureaus that are involved we will appreciate it.

Dr. CAIN. This chart shows the Department of the Interior organization—

Mr. FASCELL. We will put this organizational chart in the record at this point, without objection.

(The chart referred to follows:)



Dr. CAIN. It shows the Interior Department's organization for coordinating its own marine resource program interests and for its internal communications and planning. The nine bureaus are identified by their initials at the bottom of the chart.

Starting at the left, the Bureau of Outdoor Recreation. This comes in because of the large number of Federal areas administered by the Department of the Interior that come to the seacoast, including national parks and monuments, national recreation areas, involving not only coastline in the strict sense, but estuaries behind in some cases going on to the shelf, submarine park developments.

We have at least three places where we have made underwater park developments in relation to coral reefs. The National Park Service is in it in the same way. They are separate bureaus. The National Park Service is a management bureau and the Bureau of Outdoor Recreation is a planning and funding operation.

The Bureau of Land Management, the third, is the one which has the interest of leasing, the requirement of leasing. It is not a technical bureau working on the resources of the shelf as such.

The Bureau of Sport Fisheries and Wildlife has primary interest in fresh water fishes but it shares an interest in fishes that move between the fresh water and the sea water. It shares this interest with the Bureau of Commercial Fisheries. It is also concerned with other than anadromous and catadromous fish that live in coastal or estuary waters. The same is true of wildlife.

When we come to the Bureau of Commercial Fisheries, the next one, its major interest, 90 percent or more of its activity, I would say, is related directly to the sea. It gets, however, involved in fresh water fishes which move to fresh water and back, such as salmon.

The next Bureau is deeply interested, the Bureau of Mines.

The next one, Geological Survey, is deeply involved.

The Water Pollution Control Administration is just as concerned about the water quality of estuaries and the coastal zone as it is about fresh water on the Continent as such.

The Office of Saline Water is concerned in a lesser way because its effort is to produce desalted water using brackish or salt water as a source for the manufacture of fresh water. They also are concerned with the sea because of the problem of disposal of the heavy brines which result from the desalinization process.

Mr. FASCELL. Which one of the bureaus, Dr. Cain, would give advice or have some review with respect to radioactivity pollution of the high seas?

Dr. CAIN. The Federal Water Pollution Control Administration.

Mr. FASCELL. Is that problem an international problem at the present time? And is it being discussed anywhere? And if so, where?

Dr. CAIN. There is an International Atomic Energy organization. It is concerned with the contamination of the environment. Of course, our national body which is concerned is the Atomic Energy Commission itself.

Mr. FASCELL. They have the primary responsibility in this area, that is, radioactive pollution of the high seas?

Dr. CAIN. The Atomic Energy Commission in its own and its licensed plants have the responsibility for design and engineering and

licensing in their licensing operation to eliminate radioactive pollution, that is to say, the escape of radioactive isotopes from their operations.

Mr. FASCELL. What kind of coordination is there with your Department, if any?

Dr. CAIN. The Federal Water Pollution Control Administration has considerable powers with respect to any kind and any source of pollution.

Mr. FASCELL. I know, but do you have any kind of coordinating or advisory function with the Atomic Energy Commission with respect to international waters?

Dr. CAIN. We are involved in monitoring the environment for radioactivity in the environment.

Mr. FASCELL. You mean some of the scientific research projects, both unilateral and multilateral, are concerned with the monitoring of the deep oceans with respect to the release of radioactive isotopes? Or do I understand that there is a regular program of monitoring—

Dr. CAIN. Interior is not involved in monitoring the deep oceans for radioactivity.

Mr. FASCELL. Do you know of any bureau, department, committee, or group, that is interested in monitoring the deep ocean with respect to the determination of radioactivity?

Dr. CAIN. In a global sense, no, I don't.

Mr. FASCELL. Do you think it would be a good idea if there was one?

Dr. CAIN. Yes, I do. However, it comes back pretty directly to the nations that are in the nuclear club—

Mr. FASCELL. Who are concerned with pollution.

Dr. CAIN (continuing). And who do search hard for safe means of disposing of long-lived radioactive isotopes.

We, and presumably other nations, have put some of them in the sea. They have done so in presumably safe containers. The same agency has the responsibility for monitoring these to see whether or not they remain safe. If they don't, I suppose they have to withdraw them and do something else. It is a difficult and tricky situation.

Mr. FASCELL. Of course I understand this. I can see how, with respect to our own problem of disposal, we could make our own guarantees and safeguards. The problem, it seems to me, is with respect to the other nuclear members of the club and what is done on safeguards or understandings that we may have internationally.

It would seem to me, with respect to the problems of the resources of the high seas, that we wouldn't have much to argue about if nuclear pollution is so bad that nothing can be extracted.

We will have to pursue that a little bit further.

Dr. CAIN. Many nations were involved in monitoring at the time atmospheric tests were being performed. With the ban on atmospheric testing and other kinds of testing, many nations are still monitoring radioactivity. This is primarily in the air, but not exclusively because the isotopes settle with the rain and they become part of the food chain. They enter people as well as animals, mammals, and fish. The intensity of this pollution of the environment by radioactive isotopes has dropped dramatically since the atmospheric testing has been stopped.

Mr. FASCELL. You have already given us, and so has Mr. Terry, some examples of scientific research projects sponsored by the Department

of the Interior of the U.S. Government. Is there anything you want to add to that, or do you feel that your description has been adequate?

Why don't we leave that for the moment? You can review the record, Dr. Cain, and if you feel you want to add anything to what you have already stated with respect to the research projects you may do so.

Would you describe now the range of commercial activities relating to the ocean with which the Department of the Interior is concerned?

Dr. CAIN. The Bureau of Commercial Fisheries, of course, as the title suggests, is directly related to our fishing industry. It is not always of the same position that any given industry is because its concern is not only with aiding industry by its efforts at exploration and discovery of where stocks are and its work in the development of the technology of catching and of handling and processing, marketing and so on, which are Federal activities related to the benefit of the industry.

It also has the central purpose of persuading, or through whatever powers it has, of managing the harvest of resources so that they will be conserved. And in this sense it means so that they will not be overfished to the detriment of future fishing abilities.

In other words, our central concern is with having sufficient knowledge to know what kind of utilization of living resources of the sea can be sustained year after year, granted the availability that occurs in nature. This is the goal.

This is also the goal of industries that have a long view of their course. I am just suggesting that we are far apart in this. I am just saying it always takes the broader consideration in this case of the Government agency to keep things stabilized on a management basis.

The Geological Survey produces basic information of value to industry because both on a broad scale and in places on a smaller scale a more intensive study knowledge of the geological structure and its features of a mineralogical character of these structures are of interest to industry.

The Bureau of Mines and the Geological Survey have worked closely together in recent years under Dr. Pecora, who heads the Geological Survey, and Dr. Hibbard, who heads the Bureau of Mines.

The Bureau of Mines is directly related to the mining industry, as the Bureau of Commercial Fisheries is to the fishing industry. These are the two Bureaus that come immediately to mind that have strong direct ties to industry.

In a different way, the Pollution Control Administration has a good deal to say about operations, to see that water quality is not deteriorated by industrial or any other kinds of operations.

The Office of Saline Water is of great interest to industry if under certain circumstances sufficiently economic fresh water can be provided where it doesn't now exist. In this sense of industry these are the primary agencies.

Mr. FASCELL. It seems to me, if I might digress for a moment, that I read somewhere just recently that the cost of production of desalted water had gotten down to a fantastically low amount, less than 75 cents a thousand gallons. We thought it would take 10 years to lower the cost, yet it is now down to a matter of cents for a thousand gallons.

In your opinion, Dr. Cain, if the proposal advanced by Malta were adopted, what would be its impact on the activities, both scientific and

commercial, that are now carried out by the Department of the Interior?

Dr. CAIN. If there were an international agency, an agency of the United Nations, for example, that had responsibility for coordinating exploration and research in the oceans, you would have something comparable to what already exists in the Food and Agriculture Organization and to some extent in other organizations like UNESCO. So that there wouldn't be anything startlingly new and different about this.

When you look at the total research accomplishment in agriculture and see the contributions of nations unilaterally as well as that through FAO, you realize, I think one realizes, I seem to myself, that what the international agency does tends to spread the research more globally than perhaps national interests by themselves would to any one nation.

We, I am sure, help support through the FAO and UNESCO many kinds of research that we would not carry on unilaterally. The sum total of which, however, is very good for the research entity of the world as a whole.

Mr. FRELINGHUYSEN. If the chairman would permit, you are not suggesting that if there should be some additional responsibility on the part of the United Nations that individual national interests would be restricted?

Dr. CAIN. No; quite the reverse. I feel any such international organization would behave about like earlier ones have and do supplement research, and national efforts would continue carrying on as they had.

Mr. FASCELL. Dr. Cain, we would like to discuss briefly what other Government agencies are involved in these maritime matters. For example, what is the National Science Foundation doing?

Dr. CAIN. They have, very recently, by the action of the 89th Congress, the supervision of the sea-grant program,¹ which is a program with colleges and universities primarily for the purpose of directing research to ocean problems and, here, again, particularly with respect to training of people who have the skills, who will have the skills in the future to work on ocean problems.

Mr. FASCELL. This is a fundamental contribution to the whole science of oceanography, that is, the input by universities and institutions to provide training courses, and research, because without such a steady input we would be limiting ourselves?

Dr. CAIN. I think there is a growing effort in Government to increase support, Federal aid one way or another, to the training of oceanographic scientists of all sorts because the need exists today for more than are being produced and an apparent need for the future seems to be very much larger.

Mr. FASCELL. What is the National Academy of Sciences doing?

Dr. CAIN. The National Academy of Sciences operates through committees to study problems on its own initiative or upon request. They do this for Government and they do it for nongovernmental interests. They are not a research outfit themselves, but have a considerable history of appraising conditions with respect to many questions of national interest and national policy.

¹ See appendix, p. 228, National Sea Grant College and Program Act of 1966.

Mr. FASCELL. What is the National Council on Marine Resources and Engineering Development concerned with?

Dr. CAIN. That is very new; authorized in the last session of the 89th Congress, and the National Marine Council, which was created by that act, had its first meeting a year ago August. It has been meeting approximately once a month since then.

The Commission, the other body that was created by this act, I think had its first meeting in January. Both of these organizations have a limited lifetime according to the act that created them. The division of labor between them is essentially that the Commission is concerned with the organization of the Federal Government with respect to its ocean interests, and the Council is primarily concerned with the production of information about the conditions of the ocean and the national interest in the oceans.

The result is that the Council requested the establishment of, I think, five committees which deal with different sectors of interest. Four of these committees are fairly recent, having been established about 2 months ago. One, on International Policy in Marine Science, has been active since early May of this year. It is a very active organization.

In addition to its own committees, some of which have subpanels or subcommittees, it has organized for assisting its efforts a series of panels of non-Government scientists, people from industry, and so on, to help them appraise the present situation in Government and to advise the directions in which we should go. This body can initiate and make recommendations with respect to Federal action in the marine field.

Mr. FASCELL. The International Subcommittee of the Council; is that the one headed by Mr. Kohler?

Dr. CAIN. Yes.

Mr. FASCELL. He is also chairman of the interdepartment committee, or is that one and the same thing?

Dr. CAIN. I think they are the same.

Mr. FASCELL. That is concerned with international policy?

Dr. CAIN. Yes. It has been called the Ad Hoc Committee on International Policy in Marine Science. Mr. Kohler is the Chairman of that. There is membership on that by probably a dozen agencies of Government, including Interior.

Mr. FASCELL. Dr. Cain, what do you see as the relationship, if any, between the studies and the research which would be carried out by the Commission and the Council? Am I correct that the Commission concerns itself with the study and the Council with the structure?

Dr. CAIN. It is the other way around.

Mr. FASCELL. I understand.

What relationship, if any, do you see between the studies being conducted by the United States and the study which is underway now at the United Nations?

Dr. CAIN. The National Marine Council and Commission and its staff are directed toward the American interest. The American interest comes into relation to the international organizations which already exist or which might be created.

Mr. FASCELL. For all practical purposes, in order for us to take the position or understand what our position is going to be in the international field, wouldn't the United States independently and unilaterally have to conduct or duplicate the research or perhaps undertake even more extensive research than that which would be conducted by the United Nations under its resolution? And wouldn't that be true of all countries that have a very important stake in maritime international policy?

Dr. CAIN. I think each nation—I am certain the United States would—in its own research effort emphasize the territories over which it has jurisdiction, and secondarily the interests beyond its jurisdiction where it has the freedom to develop and acquire and manage resources.

Mr. FASCELL. The thought that flashes through my mind is that the research being conducted under the U.N. resolution could be of limited value because no country would rely on that research to provide it with information required to establish its own national priorities. In other words, the individual countries still have a need for research directed to their particular needs, plans, and aspirations. Therefore, the research undertaken by the U.N. would be primarily of value to the staff of the Secretary General, and they are not likely to participate in anything that is being done otherwise.

I am at a loss, frankly, to interpret correctly what the purpose of that study is.

Dr. CAIN. I think I would like to make one more comment.

Mr. FASCELL. You may say I am wrong in my interpretation if you like.

Dr. CAIN. I think the specialized agencies of the United Nations that have carried on research or in one way or another are sponsoring research have primarily directed their attention to problems of nations which have a low technical capacity of their own to carry on research. It has been a form of assistance so that if UNESCO has helped Brazil in its dragnet fishing technologically it is because they needed the help rather than they were not showing they were capable of doing it themselves.

Secondly, these international agencies are able to direct a collective attention to the acquiring of information which will help answer international problems of resources management.

These are the two sorts of things that international agencies do. Neither one of which produces for any nation I think, any cause to lessen their own efforts of carrying on research in their own interest. It is simply a different ball park, as I see it.

Mr. FASCELL. What is the Department of Commerce doing in this field?

Dr. CAIN. The Department of Commerce formed an organization in 1966, I believe in 1966, which has become known as the Environmental Sciences Services Administration—ESSA. What they did was to put together under an assistant secretary in Commerce operations which they already had in Commerce, that is to say, this was an internal reorganization, including the Coast and Geodetic and the Weather Bureau: those are the main formulations, and this was in the direction of improving their abilities both scientifically and organizationally to study especially the physical conditions of the seas, and here again

particularly with respect to the ability to forecast, usefully forecast from their knowledge of the physical conditions of the sea some consequences that would be of interest obviously in weather forecasting, of interest to shipping or any other relationship of the sea.

So scientifically one can say they are primarily involved in the interactions between the oceans and the atmosphere and the consequences of these interactions physically and what can be forecast from them.

I hope my description of ESSA is compatible with your own descriptions.

Mr. FASCELL. If it isn't we will give you a chance to correct it.

Are there any other departments, bureaus, agencies, commissions, committees or subdivisions thereof that are involved in this area that we haven't discussed?

Dr. CAIN. Yes, indeed. The National Marine Council recently formed a Committee on Multiple Use of the Coastal Zone. This is coastline interior, estuaries, and external to that of the continental shelf for an undefined distance.

This is the zone of the seashore and contiguous waters and seabed seaward and the waters and land interior that are generally called estuaries.

When this was formed any of the agencies that have membership on the National Marine Council or have observers on them that have an interest in this could have membership on the Multiple Use of the Coastal Zone Committee.

There are 13 agencies of Government that felt sufficiently interested. This includes the Maritime Administration. It includes the Department of Defense which in this case agreed that the Corps of Engineers would be responsible on this committee not only for Army interests but for Navy or any other defense interests. It includes the Department of Transportation. It includes Interior, of course; the Atomic Energy Commission; the National Science Foundation; the Smithsonian Institution. Almost everybody but Agriculture is on it.

I can give you the details on that if you would like.

The point is that—let me compare it this way, Mr. Fascell—a while ago we were talking about the very broad interest of Interior in the oceans, we having nine bureaus. Our problem in Interior is very similar to others in Government, how do you organize and carry on your national interests in the oceans.

This is one of the things, the central thing that is involved in the Marine Act which set up the Council and Commission: How does the Federal Government organize itself for effective use of the sea?

Obviously, as I just said, the Navy is interested, the Corps of Engineers because they have vast operations in the coastal zone, Transportation is interested. Interior we have described. It is a very broad coverage.

Mr. FASCELL. Has the Ad Hoc International Policy Subcommittee been meeting as you say, about once a month since May?

Dr. CAIN. I think that is about right. It has panels or subcommittees which have met often. There are six of those.

Mr. FASCELL. Has this committee arrived at any policy decision?

Dr. CAIN. There has been a position taken with respect to the Malta proposal, for example.

Mr. FASCELL. Which is reflected in the State Department position in which the Department of the Interior now concurs?

Dr. CAIN. The Department of the Interior has a membership on that committee and participated in the discussions which led up to the time when a policy position was taken by the State Department.

Mr. FASCELL. We would like to inquire further on those matters in executive session, Dr. Cain, if you can remain for a short time.

Do you have any other questions at this time, Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. No.

Mr. FASCELL. Very well. The subcommittee will now proceed into executive session.

(Whereupon, at 11:20 a.m., the subcommittee proceeded into executive session.)

EXECUTIVE SESSION

Mr. FASCELL. The subcommittee will come to order.

Dr. Cain, tell us what you can regarding our policy, where we stand now, and where we are going?

First of all, I think we'd better be as explicit as possible as to what you understand our policy to be.

Dr. CAIN. With respect to what?

Mr. FASCELL. With respect to this international question.

Dr. CAIN. That has come to a head because of the Malta proposal?

Mr. FASCELL. Yes.

STATEMENT OF DR. STANLEY A. CAIN, ASSISTANT SECRETARY FOR FISH AND WILDLIFE AND PARKS, DEPARTMENT OF THE INTERIOR

Dr. CAIN. I understand our policy—the position which we have arrived at and which will be the position taken by Ambassador Goldberg and his people, that is to say the Federal position—to be that the Malta proposal is not acceptable to us. It is premature. We do not have the information to make safe decisions with respect to the questions that are raised by the Malta proposal. [Security deletion.] We don't want to have to take any position with respect to some of these questions. That, I think, is the first point that is clear.

No nation, I think, likes to go before the General Assembly of the United Nations in a strictly negative position, especially if the negative position for one reason or another would be unpopular. Therefore you look for positive suggestions as alternates.

In this case it is the proposal that the United Nations establish a committee in the General Assembly—a Committee on the Oceans—composed of proper number of nations [security deletion] to which committee would be referred for study such questions as those which have been raised by the Malta proposal.

Having suggested a committee of the General Assembly to study the Malta proposal, why shouldn't it do other things, too? [Security deletion.] We have suggested that a program of research be studied by this same committee if such a committee is formed.

Thus the committee would probably get into the planning problem for coordinated international research. [Security deletion.]

That is the second proposal.

Mr. FASCELL. Let me stop you right there at that point.

Don't we already have that in the Decade of International Hydrological Study?

Dr. CAIN. That is too limited in its purposes. Just as the international biological program is too limited in its purposes.

Mr. FRELINGHUYSEN. Could I ask a question?

Are we talking about the oceans, including the shelves as well as the deep seas now, or are we trying to eliminate from the jurisdiction of the proposed U.N. committee the very broad and presumably far more accessible areas that the shelves themselves represent?

Dr. CAIN. The frame of reference or guideline for a committee of the General Assembly is not spelled out. Presumably this would be a problem for the General Assembly itself. It isn't clear whether this would deal with the deep oceans only, or whether it could also deal with the continental shelf as well as the open oceans.

Mr. FRELINGHUYSEN. You mean our own proposal is going to be unclear as to what we feel should be included? If so, I should think the Ambassador might be in an embarrassing position—

Dr. CAIN. The guidelines are not spelled out in any detail.

Mr. FRELINGHUYSEN. Wouldn't it be advisable to spell them out before he starts making public speeches about setting up committees?

Dr. CAIN. Yes, sir.

Mr. FRELINGHUYSEN. I would think, if we are going to make the U.N. a direct vehicle, if we are going to suggest that the U.N. take an interest, and develop better coordination between maritime nations than now exists, we may well be touching on national interest and participation and responsibility for these continental shelves.

I would think we should think twice about abrogating, or seeming to abrogate, what is at the moment primarily a national responsibility.

Mr. FASCELL. I would want to add to the very important point which Mr. Frelinghuysen has raised. If the United States is just going to throw out a series of suggestions in an effort to be affirmative in the U.N., and one of those suggestions is the formulation of a committee to study the whole matter because any action might be premature until we have the basis upon which to act [security deletion] and we are unclear exactly whether such a committee should have a coordinating function or operating function or whether it is going to cover the deep seas or the continental shelf, then it seems to me that on the one hand we are saying we can't act because we don't have any information, and on the hand, we are acting.

Mr. FRELINGHUYSEN. "Development" to my mind must mean the continental shelves. Maybe I am influenced by what previous witnesses have said who talked about the potential in that area. And also because of the difficulty of utilizing what lies at the depths of the sea.

I would think the research or studies, call it what you will, would really be exploitation and exploration and coordination of effort for the shelves. This might be a difficult area if it did restrict us in what we considered national responsibilities.

I think this would be even more sensitive, in other words, than the Malta resolution, because you could turn off the Malta resolution on reasonably narrow grounds.

Dr. CAIN. I think probably the central question here is the seabed, the deep ocean seabed. I do not believe that it has been confined to that. In other words, the frame of reference and guidelines have not become clear.

Mr. FASCELL. Dr. Cain, if it isn't clear and we are going to have to examine that language, then by this generous gesture we will have opened more Pandora boxes than we have tried to close by holding these hearings. Nobody has even mentioned these studies before, which obviously are subject to the kind of interpretation that Mr. Frelinghuysen and I see as a possibility [security deletion].

Mr. FRELINGHUYSEN. Unless there is some assurance that we are not giving away something in this recognition of international responsibility, some assurance that there will not be interfered with our potential for development of these resources ourselves. Otherwise we are going to get into a lot hotter water than we are now.

Mr. FASCELL. The question now seems to be, Dr. Cain—because we don't have the exact concept as it is going to be presented—the question seems to be one of Interior's significant interests with respect to marine research now being carried on, and certainly with respect to the continental shelf. It seems to me that no statement which amounts to a policy position and which would be subject to several interpretations or misunderstandings should be issued or submitted without Interior's absolute concurrence.

Dr. CAIN. The idea of such studies—let me give you one that is simpler first—which has been given the name "Ocean Acre." We are not talking about an acre, however, but about a column of water of whatever dimensions somewhere in the open ocean, which would be studied from the surface to the seabed, hydrologically, biologically, and physically.

The ocean studies that have gone on have not gone on with respect to this kind of profile information in place as conditions change with time. What they have done has been on a geographic spread rather than this. We have no objections to this concept and the kind of research that would be participated in by many nations according to their capabilities.

In the first place, it is hard to see where this runs into any questions of jurisdiction or ownership. As research which could involve any and all kinds of exploration and data-gathering with respect to the nature and conditions of the sea, the objectives in terms of science are unobjectionable. But it is obvious that as information is gained about the sea, and people see advantages or benefits that can be derived as a consequence of the increase of knowledge, then the question naturally arises: Where is this something or other that is valuable and how do you get ahold of it?

With respect to open ocean fisheries, the principle of the freedom of the sea has always operated and a common good in the economic sense is reduced to ownership when it is taken into possession. It is because of this that international agreements which have limited the action of individual nations for some purpose of conservation have come about.

If the same principle applies to seabed resources, then you have a territorial problem immediately. What we have, of course, is a

clear control first within territorial waters; second, what is unilaterally determined by the power of a nation's government as a claim on the seabed; and finally the continental shelf to 200 meters or beyond, as the term is defined by international agreement.

With respect to minerals, rather than things which move around like fish, we come immediately into this problem of jurisdiction, and you are absolutely right. It is clarified by degrees, and a great deal is not clarified at all. In other words, there are many international problems that are residual.

This is one of the reasons for the Government's present position. We not only don't know enough about the natural resources of the ocean, the conditions of the oceans, how to benefit from them, but we don't have a legal framework for deciding who gets the benefits.

Mr. FASCELL. It seems to me the crux of point No. 2, as far as U.S. policy is concerned, is, What is contemplated by additional cooperative international research? As soon as we know that, we will be able to understand the policy.

Dr. CAIN. I can give you some information about it.

Mr. FASCELL. That would be very good. We would be pleased to have whatever you can give us.

Dr. CAIN. Such a research program would emphasize the acquisition and application of knowledge to the resources of the seabed and subsoil by providing personnel, materiel, facilities, and other support for the acquisition of knowledge. This is the research business we have been talking about.

There would be a sharing of the scientific studies of the seabed and subsoil with other nations. There is nothing unique about this. In all of our research under any of these international agreements we exchange information.

We would probably assist other nations to develop their related capabilities in the field of marine science and technology and to coordinate their national research efforts with those of other States in the interest of gaining greater knowledge. This would mean where two nations are contiguous in their interests that they would coordinate to gain even greater knowledge, like the United States and Canada or the United States and Mexico. Where we have a border, we would do our planning for research to some extent jointly so that it doesn't stop at an arbitrary line.

[Security deletion.]

Mr. FASCELL. Has the Department of Interior concurred in this proposal, Dr. Cain? It seems that the Ambassador is about to make this proposal, as I understand it.

Dr. CAIN. [Security deletion.] We have considered the matter. It was considered by an Inter-Agency Committee on International Policy in Marine Science. The committee was established at the request of the Vice President, Chairman of the National Marine Council.

Mr. FASCELL. It would go to the State Department presumably?

Dr. CAIN. That is one route.

Now you get the possibility, you have the situation in which foreign policy is the central responsibility of the State Department, the President and the State Department.

Mr. FASCELL. What you are saying is that the Council sends its

recommendation to two places—to the President and the State Department?

Dr. CAIN. The Council would report to the President and Congress according to the act establishing the Council.

Mr. FASCELL. Was that done in this particular case?

Dr. CAIN. No, sir.

Mr. FASCELL. With respect to this present policy position?

Dr. CAIN. No, sir.

Mr. FASCELL. It was not done?

Dr. CAIN. No, sir.

Mr. FASCELL. The agency that Congress created has not participated formally in making this policy decision?

Dr. CAIN. I don't believe the State Department has referred this position to the National Marine Council.

Mr. FASCELL. They didn't on their own initiate any position?

Dr. CAIN. The question hasn't come before the Council.

Mr. FASCELL. I am not being argumentative, but it seems to me the question before the Council is just like a question before the Congress. I don't think they need an initiating document or the introduction of an agenda item or a resolution in order for them to take action. It seems peculiar to me that the very organization that Congress has tried to form to coordinate and formulate fundamental policy decisions hasn't acted on one in which the United States is about to take an international policy decision.

Mr. FRELINGHUYSEN. Could I get back to your description in this policy statement, the "application of knowledge that is gained?" The word "application."

I am interested in this possibility. Let us suppose such a research program is established and one of the functions of this international organization is to explore for oil. Suppose they discover oil, then the application of the knowledge that oil is there leads to the question, how do you dispose of it and who gets it?

Does this mean, in other words, that we are advocating transferring responsibility for what is done with the end product of that knowledge, in this case the oil?

Dr. CAIN. You are quite right about the word "acquisition." It would mean that all states in a position to do so would emphasize the acquisition and application of knowledge.

Mr. FRELINGHUYSEN. That is what I mean. Acquisition is one thing but the application of knowledge—

Dr. CAIN. Of the seabed and subsoil by doing this, that and the other. Knowledge can be applied in many ways.

So the application, for example, if it is knowledge of the seabed with respect to a living resource like king crab which is caught on the seabed and can be caught at depths greater than that defined for the continental shelf, 200 meters and so on, this application goes back to the individual nation.

It may be on a basis of unilateral action or it may be on the basis of some kind of international agreement between two or more nations.

You would have, I think, the same problem with respect to the application of any geological knowledge or any knowledge about minerals. Application here doesn't in any sense determine the political question or the jurisdictional question.

MR. FRELINGHUYSEN. In other words, would an individual nation which acquires the knowledge or a group that acquires the knowledge, still maintain a national interest in the asset? Or will it be an international interest?

DR. CAIN. There is nothing in the research proposal that endeavors to determine who shall take advantage of knowledge that would be gained or how it should be done or how it should be restricted or not restricted.

This doesn't come to that point, although it does say, in effect, as I understand it, that research is for the purpose of human welfare. It is to be applied, this information is to be applied. But it doesn't determine who, where, or how it shall be applied. It doesn't try to do this.

MR. FASCELL. Before it gets too late, Dr. Cain, let's see if we can finish with the remainder of the present policy position. You have covered two points so far.

MR. FULTON. Could I have a short question?

MR. FASCELL. Yes, Mr. Fulton.

MR. FULTON. Who is really behind this particular proposal? Where in Government has it been initiated?

MR. FASCELL. Which one?

MR. FULTON. The proposal on the ocean bed.

Take the general principle of the United Nations or some international body either having research and development in the ocean bed or as has been said here "the application." Where has that arisen? Is it within our Government? Is it without the Government, in the private sector of the United States, or is it abroad? What organization is the pusher? How has this happened?

MR. FASCELL. Dr. Cain, it would seem to me that you might take it in two parts; first, the Malta proposal, and then the research program.

MR. FULTON. Instead of going into that, you can put a statement in the record.

(The information requested follows:)

STATEMENT OF PROPOSED RESEARCH PROGRAM AND PROPOSED U.N. COMMITTEE

As a result of proposed actions by other nations in the 22d U.N. General Assembly, Mr. Herman Pollack, Director, International Scientific and Technological Affairs, Department of State, acting as the Chairman of the Ad Hoc Committee on International Policy in the Marine Sciences surfaced for study and the development of recommendations to the Ad Hoc Committee on a cooperative international research program. Greater knowledge of the seabed and subsoil is needed in the interest of utilization of its resources.

Also surfaced by the Ad Hoc Committee was the proposal for the establishment of a Committee on the Oceans to consider questions raised in the General Assembly.

MR. FULTON. The second point is on historic waters and historic rights. I wish you would put a statement in the record as to how it would affect that area.

DR. CAIN. Historic rights?

MR. FULTON. Yes, and certain waters that do not have within them the idea of sovereignty or ownership.

MR. FASCELL. Historic fishing rights, is that what you mean?

MR. FULTON. Any kind—

MR. FASCELL. Any kind of historic right?

MR. FULTON. Yes.

That is all.

Dr. CAIN. Mr. Chairman, with respect to that specific request, certain historic or traditional rights have been agreed upon with certain conditions and certain places. This is not agreed upon by departments or representatives like myself. This is always international negotiation. It goes to either existing international law or steps in the creation of international law or understandings between governments and treaties.

The meaningful answer to that question would have to be given by the State Department. We know conditions in which traditional rights have been recognized that relate to resources that Interior is interested in. We can tell you this sort of thing.

Mr. FULTON. Rather than take the time now, will you put it in the record?

(The information requested follows:)

TRADITIONAL FISHING RIGHTS IN THE U.S. CONTIGUOUS ZONE

Public Law 89-658, approved October 14, 1966, established a 9-mile fisheries zone contiguous to the territorial sea of the United States in which the United States "will exercise the same exclusive rights in respect to fisheries in the zone as it has in its territorial sea, subject to the continuation of traditional fishing by foreign states within this zone as may be recognized by the United States".

An agreement between the United States and Mexico in which each recognized certain traditional fishing rights of the other country was concluded September 19, 1967. In the near future, the United States expects to begin talks aimed at negotiating a similar agreement with Canada.

The United States has not recognized traditional fishing rights of any other country, although certain fishing privileges within the U.S. contiguous zone have been granted the U.S.S.R. and Japan.

The privileges granted the Soviet Union are covered by the Agreement on Fisheries: Northeastern Part of the Pacific Ocean off the United States Coast, effective February 13, 1967, for one year. That agreement allows Soviet vessels to continue trawling in a limited area inside the U.S. contiguous zone off Alaska. That privilege was granted in exchange for a Soviet agreement to place limitations on their fishing operations off the U.S. west coast outside the U.S. 12-mile zone of fisheries jurisdiction.

Japan refused to recognize the exclusive jurisdiction of the United States in the 9-mile contiguous zone established by P.L. 89-658. Nevertheless, Japan and the United States both agreed to set aside their legal position on this issue and work out a practical solution to deal with established Japanese fisheries inside the U.S. contiguous zone. This was done in a series of agreements concluded May 9, 1967, by an exchange of notes between the two countries, which are effective, with one minor exception, until December 31, 1968. Under these agreements, Japan agreed to refrain from fishing in the U.S. contiguous zone except for certain fisheries in specified areas. The areas where Japan is allowed to continue some fishing inside the U.S. contiguous zone include certain waters off the coast of Alaska, the Pribilof Islands, American Samoa, Guam, and some smaller islands of the Pacific Ocean and the Caribbean Sea. These agreements with Japan state that they shall not be "deemed to prejudice the claims of either Government in regard to the jurisdiction of a coastal state over fisheries." Thus the United States has not recognized any traditional fishing rights of Japan, although the United States has allowed Japan to continue fisheries in certain areas of the contiguous zone where Japan had conducted operations in the past.

Mr. FASCELL. Let's see if we can finish now. You have covered two points of present U.S. policy. Are there others?

Dr. CAIN. With respect to the resources of the seabed, the deep seabed, I think that you will all remember that when the *Oceanographer*, a research vessel, was dedicated by President Johnson in July of 1966, some 15 months ago, he said:

Under no circumstances, we believe, must we ever allow the prospects of rich harvests and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep seas and the ocean bottoms are, and remain, a legacy of all human beings.

I would then go on to comment that when issues are under study or positions in committees of Government or otherwise, and Interior participates, we participate properly in our technical competence with respect to resources, to research, to the measures to accomplish conservation. If it is a governmental policy question we can talk about the consequences of this but we cannot determine that policy and shouldn't try to.

Your questioning is leading up to really the question of where the authority in foreign policy resides. This is a question where I see what happens but it isn't a question that I am an expert to comment on.

Mr. FASCELL. Without trying to get into that, we recognize of course there are many facets to the formulation of foreign policy and Interior has its role to play.

As I understand it at this juncture, the two points which you have discussed are the only positions as far as the United States is concerned on the international question?

Dr. CAIN. They have made it very clear that they will not approve and will resist the Malta proposal. As a substitute they have a positive proposal for a committee of the General Assembly, a Committee on the Oceans, the exact parameters of which are not completely defined. It probably will be a function of the United Nations to produce a more precise frame of reference and guidelines in their discussions.

Mr. FASCELL. The third point is the research program.

Dr. CAIN. If formed, to it would be referred the questions raised by the Malta proposal.

Mr. FASCELL. This gets back to a kind of fundamental question.

Since the Committee of the National Marine Council had no hand in formulating any of these three points—

Dr. CAIN. This isn't quite so. These points that have been discussed in this Ad Hoc Committee on International Policy in the Marine Sciences—

Mr. FASCELL. The Council itself has made no recommendations one way or the other? At least that is what I understood your statement to be.

Dr. CAIN. The position taken by the Ad Hoc Committee would be a policy position to guide Ambassador Goldberg in the United Nations in these discussions—subject of course to further policy guidance as time goes on—what I said was that did not move from the Committee to the Council itself.

Mr. FASCELL. Where did it go? I am still at a loss. What I need to know is did the Ad Hoc Committee make a recommendation with respect to these three items, and if so, to whom did they make the recommendation?

Dr. CAIN. They made a recommendation by State Department action.

Mr. FASCELL. I am sorry, I don't quite understand.

Dr. CAIN. There is a policy position taken by State Department action.

Mr. FASCELL. The State Department has acted, that is clear, am I correct? Was it with, or without, the concurrence of the Ad Hoc Committee and the Council? That is all I am trying to find out. I understood originally that it was without the recommendation of the Ad Hoc Committee.

Dr. CAIN. It is without the concurrence of all the members of the Ad Hoc Committee.

Mr. FASCELL. You mean some of them concurred, some of them disagreed?

Dr. CAIN. Some of them did not give a concurrence because it was impossible to establish a department-wide position.

Mr. FASCELL. There was no formal action, in other words, by the Ad Hoc Committee.

That gets back to the fundamental question——

Mr. FULTON. Did you say "Yes" to that, that there was no formal action by the Ad Hoc Committee?

Dr. CAIN. I did. That is to say, the last two steps of the normal machine were not consummated.

I would like to give you a reason why I think this happened. Because the resolution, the Malta resolution is on the agenda of the United Nations it was expected that it would come up for discussion next week. When the National Marine Council met a week ago Monday, the research proposal was on the agenda for discussion and could have been acted on by the Council, but the meeting was confined to information and discussion, with no action until November.

The State Department and Ambassador Goldberg are subject to having to discuss the Malta proposal at any moment with no ability to wait until November. The State Department has sent the position paper to Ambassador Goldberg, so I have been told, without going through the Council.

Mr. FASCELL. I understand.

Dr. CAIN. I think it will go through the Council in November and they will probably approve. This is a time problem. I can sympathize with the State Department.

Mr. FASCELL. I don't know whether it is a time problem or not, Dr. Cain. It sounds like a maneuver to me, primarily because everyone seems to have been caught unawares and they weren't ready for it. Why? We have had the problem on the horizon for some time. We ought to have been ready to deal with it.

Mr. FULTON. Could I say something?

I am an adviser on science and research for our U.S. mission at the United Nations, and I heard nothing on it. In that other capacity you see there was a bypass and that is why I am here this morning.

Mr. FASCELL. We are delighted to have you.

That leads to one final question, Dr. Cain. It is the \$64 question: Who, what individual, came up with the idea of the research proposal? Who is he? He can't be anonymous.

Dr. CAIN. I don't know.

Mr. FASCELL. You don't know. That is the whole point and here your Department is deeply involved in a whole range of activities relating to this field.

Dr. CAIN. I don't know.

Mr. FASCELL. Do you know, Mr. Terry? Mr. Layton?

Mr. TERRY. No.

Mr. LAYTON. No.

Mr. FASCELL. We had better ask the State Department, since they sent the statement.

Dr. CAIN. The idea didn't originate with me.

Mr. FASCELL. I also get the impression that the Department of the Interior didn't concur, although I didn't ask you and you didn't comment.

The subcommittee is adjourned.

We thank you for your contribution, Dr. Cain.

Dr. CAIN. Thank you.

(Whereupon, at 11:55 a.m., the subcommittee was adjourned, subject to the call of the Chair.)

THE UNITED NATIONS AND THE ISSUE OF DEEP OCEAN RESOURCES

TUESDAY, OCTOBER 31, 1967

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON INTERNATIONAL
ORGANIZATIONS AND MOVEMENTS,
Washington, D.C.

The Subcommittee on International Organizations and Movements met, pursuant to adjournment, at 10:05 a.m., in room 2255, Rayburn House Office Building, the Honorable Dante B. Fascell (chairman of the subcommittee) presiding.

Mr. FASCELL. The subcommittee will please come to order.

We meet this morning to continue hearings on resolutions relating to the question of jurisdiction of resources on the bottom of the ocean.

We have heard expert witnesses testify during our earlier hearings that the resolution of this issue may involve vast economic resources, communications, security, and the well-being of millions of people in the world.

To testify before the subcommittee we are very pleased to welcome Dr. Robert A. Frosch, Assistant Secretary of the Navy for Research and Development, who is accompanied by Rear Adm. O. D. Waters, Jr., Oceanographer of the Navy, and Rear Adm. Wilfred A. Hearn, Judge Advocate General of the Navy.

The open session will be followed by an executive session meeting in order that the subcommittee may have the benefit of our witnesses' views regarding some issues that affect the security of our country.

Gentlemen, we are very pleased to have you here this morning.

I understand, Mr. Secretary, that you returned from Europe just this past weekend, and for this reason we are all the more appreciative of your willingness to appear before the subcommittee on rather short notice. I understand that you do not have a prepared statement, but that you are ready to reply to our inquiries. I will therefore begin this session by asking you to outline for us your reaction to the proposition contained in House Joint Resolution 816 and the two dozen related resolutions which express the view that the United States should not at this time attempt to reach a decision on vesting in the United Nations jurisdiction over the deep ocean resources.

We will be happy to have your comments on this matter.

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**STATEMENT OF HON. ROBERT A. FROSCH, ASSISTANT SECRETARY
OF THE NAVY FOR RESEARCH AND DEVELOPMENT**

Mr. FROSCH. Thank you, Mr. Chairman, I am delighted to appear before the subcommittee. As you know, my work in Europe was closely connected with this problem. I was the chairman of the U.S. delegation to the Intergovernmental Oceanographic Commission of UNESCO. We discussed a number of topics that are related to this subject.

The only resolution that I have seen is House Resolution 816. I presume the other resolutions are similar in nature. I agree completely with the substance of the resolution. That is, it is much too early in our knowledge and understanding of the nature of deep ocean resources and of the technology that will be required to exploit them for us to consider major legal questions regarding its exploitation and ownership, certainly too early for us to think that we would know what we were doing if we were to take action to vest control of ocean resources in an international body in a specific way.

I think this is the general view in the executive department; it has been well coordinated among the various departments and agencies. I believe it is the view of the State Department, and I would defer to them in this matter, that while the resolution is correct and agrees with the policy of the executive department, it is unnecessary because it is in such close agreement with what has been determined to be our current policy.

Thank you, sir.

Mr. FASCELL. Admiral Waters, do you wish to add to the Secretary's comments?

**STATEMENT OF REAR ADM. O. D. WATERS, JR., U.S. NAVY,
OCEANOGRAPHER OF THE NAVY**

Admiral Waters. No, sir; I don't believe so, except to say that we, within the Navy as far as my sphere of operations goes, we are in full concurrence with what Secretary Frosch has just said. We don't know enough yet about the deep oceans. We are trying as fast as we can to learn more.

Mr. FASCELL. Admiral Hearn, you have a prepared statement. Would you proceed, please.

**STATEMENT OF REAR ADM. WILFRED A. HEARN, U.S. NAVY,
JUDGE ADVOCATE GENERAL OF THE NAVY**

Admiral HEARN. It is a pleasure to appear before this subcommittee as Judge Advocate General of the Navy to testify with respect to House Joint Resolution 816 and similar resolutions which oppose the vesting of title of the deep ocean floors in the United Nations.

This subcommittee has already heard the testimony of Mr. Popper and Mr. Pollack of the Department of State, and Assistant Secretary Cain of Interior. The Navy has been working very closely with the Department of State and other interested agencies in connection with

development of a coordinated national oceanographic program and in developing positions with respect to related proposals and initiatives. Accordingly, the remarks made by Mr. Popper and Mr. Pollack, in every essential respect, reflect our thinking on the matter.

The primary rationale underlying our position is that we have, at the present time, insufficient information regarding the extent of underseas resources, the means of obtaining access to them, the conditions for processing and marketing them, and the impact their extraction and mining will have on the other uses of the sea. As Secretary Frosch and Admiral Waters have testified, our knowledge of these problems is very limited indeed.

It is our firm conviction that this lack of knowledge renders proposals to internationalize the deep ocean floor premature. Recognizing that there are many complex and far-reaching issues involved in this question, there are several compelling arguments which support the validity of the conclusion reached in the proposed joint resolutions—that any action at this time to vest control of deep ocean resources in an international body would be premature and ill advised.

Proposals which would place the seabed and subsoil of the deep oceans under international ownership and control are appealing to some. One reason that taking such a step right now is particularly appealing to the advocates of this idea is because there are few, if any, vested economic interests in the area at the present time. The logic behind these proposals is that it is desirable to resolve problems of conflicting uses before they arise, both on the seabed alone and between exploitation of the seabed and other uses on the surface.

The problem of solving conflicting use problems is not new to the high seas. As specific problems have arisen, specific solutions under international law were devised to provide for a reasonable accommodation of interests. A classic example of these are the International Regulations for Preventing Collisions at Sea, which lay down the "rules of the road" for high seas traffic. Lying behind these specific rules is the general rule of customary international law—codified by the High Seas Convention—that one use may not unreasonably interfere with other lawful uses.

A new element was introduced into the problem of conflicting use by the emergence on the high seas of fixed installations resting on the continental shelf and extending above the surface. While all the conflicting uses contemplated by the rules of the road are transitory, here a more or less permanent occupation of a given area by one user is involved.

The general rule governing this new situation is that exploration of the shelf and exploitation of its resources must not result in any "unjustifiable interference" with navigation, fishing, or conservation. This rule is codified in the 1958 Geneva Convention on the Continental Shelf by permitting the establishment of a 500-meter safety zone around shelf installations which all ships must respect; by requiring notice of construction and permanent means for warning of the presence of shelf installations; and by prohibiting the establishment of shelf installations or safety zones "where interference may be caused to the use of recognized sealanes essential to international navigation."

The most important aspect of these rules regarding conflicting use of the oceans is that they arose in response to existing problems. The continental shelf is relatively shallow and the oil rigs in use were clearly obstructing the surface. Essentially, by regarding navigation in recognized and essential sealanes as a permanent preexisting use, an accommodation of existing conflicts was reached.

At present we really do not know whether exploitation activities beneath the deep oceans will be self-sustaining or will require permanent surface support. The Navy at this moment is attempting to liberate its deep oceans research operations from such sustained surface support. The few support vessels presently being stationed over deep oceans research activities certainly present no serious conflict of use problems. Indeed there are precise international navigational rules in force with respect to vessels which are not underway. It is not possible to predict at this time whether any significant conflict of use between deep ocean exploitation and surface operations will ever develop—except perhaps with respect to the problem of dumping from the surface.

It would seem that reasonable prudence would require an expanded knowledge in order that the implications of the continental shelf experiment are better understood before plunging into literally uncharted seas. This is particularly true because no conflict of use problems regarding exploitation are likely to arise at great ocean depths for quite some time.

I am not suggesting however that we sit by indefinitely and watch the continental shelf regime extend to the middle of the oceans. What I am suggesting is that—with the remote but possible exception of a few seamounts—actual oceanic activities will not force us to make a final decision for a while. In the meantime we are giving careful consideration to all the options, some of which are national control by extension of the shelf regime, national control under principles of effective occupation, limited international regulation by an existing or new international agency, or a combination of these. We are expanding our efforts to learn more about the potential wealth of the sea.

The oceans are not outer space, and they are not Antarctica. They lie here at our feet. And they are—and have been for thousands of years—essential to the communications, security, and well-being of most, if not all, of the peoples of the world. The fact that they are becoming even more important to all of us means that we should be more, not less, cautious about arriving at precipitous conclusions based on nothing more than assumptions and predictions.

As to whether it is necessary to proceed with the proposed resolutions in view of the testimony elicited from the various witnesses before this subcommittee, I defer to the views of the Department of State.

Mr. FASCELL. Thank you very much, Admiral Hearn.

Referring to the specific "rules of the road," you say that there is a general rule of customary international law codified by the High Seas Convention, that one use may not unreasonably interfere with other lawful uses. What is the effective date of this High Seas Convention, and what are its provisions?

Admiral HEARN. The High Seas Convention was adopted by the Law of the Sea Conference which was held in Geneva in 1958 under

the sponsorship of the United Nations. It came into effect for the United States in 1962. It provides that freedom of the seas shall include freedom of navigation, freedom of fishing, freedom to lay submarine cables and pipelines, freedom to fly over the high seas, and such other freedoms as are generally recognized in international law, but it further provides that these uses shall be reasonable with respect to the rights of other people to use the high seas for similar purposes.

Mr. FASCELL. So that if, for example, a question arises—as I understand your testimony—and the question has not yet arisen—relative to a deep seabed fixed installation, under the rules as now codified, that installation would not or should not interfere with underwater navigation in a recognized sealane?

Admiral HEARN. That is correct. Adopting the principle that was adopted in the Continental Shelf Convention, that is right, sir. You have the right to extend rigs above the sea which would be a hazard to navigation, but they must not unreasonably interfere with navigation.

In other words, you have a right to use the seas in a reasonable fashion vis-a-vis the rights of other people to do the same.

Mr. FASCELL. Are there any known seabed installations, and I use "bed" to signify shelf, slope, or deep ocean, which now interfere with underwater navigations?

Admiral HEARN. Wherever they are there is an interference.

Mr. FASCELL. In the sense that regardless of whether it is inside or outside a recognized sealane.

Is there such a thing as a recognized sealane for underwater navigation?

Admiral HEARN. I think there are recognized sealanes, particularly on our continental shelf in the Gulf of Mexico where there are many, many installations of this character, which must be respected by those who are exploiting the continental shelf. I am not aware that there is any distinction between underwater and surface navigation. The right to navigate includes both.

Mr. FROSCH. I think the case that one would be concerned with would be one where navigation is restricted to a channel or to a narrow strait by natural topography and where someone engaged in exploitation might want to build his installation in such a way as to block or interfere with a major part of the channel or strait.

I think that is the kind of case that Admiral Hearn has been discussing and the one that is in fact treated by the convention. I think the convention would make it clear that one would have to find a means of exploitation in that region that did not block a recognized route of navigation or make it dangerous.

With regard to submerged navigation in the deep ocean, the ocean is deep enough and large enough so that unless some structure was truly gigantic and extended as a blockage for literally hundreds of miles, it would hardly be a major hazard to navigation unless it were in a place which was deep but was a narrow strait or something of that nature.

I think the cases that one would worry about are fairly well defined special cases and I know of no structure that now exists as an interference to navigation.

Mr. FASCELL. Thank you. That is a very thorough and complete answer to the question.

Can you describe, now, some of the Navy undertakings and legal issues which might be involved, here in open session?

Mr. FROSCHE. Admiral Hearn might describe some of the legal issues with regard to navigation on the high seas. With regard to special undertakings that are of interest, I would prefer to defer them to an executive session if I might, Mr. Chairman, just making the remark in open session that the Navy has used the sea bottom for many purposes for many years, and it is incorrect to assume that we are not using the sea bottom. Any attempt to deal in a radical legal way with the sea bottom would interfere with some national security enterprise. I will be happy to describe some of those to the subcommittee in executive session.

Mr. FASCELL. Thank you.

Admiral Hearn.

Admiral HEARN. I am not aware at the moment of any special legal problems being encountered now other than to apply the various conventions, the High Seas Convention and the Continental Shelf Convention to actual fact situations. I am not aware of any special problem that has arisen since the adoption of those conventions in relation to the subject matter that we are discussing this morning.

Mr. FASCELL. Mr. Gross, do you have any questions?

Mr. GROSS. I believe I will reserve my questions and pass on to Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Admiral Hearn, you referred to establishment of rules of the road for high seas traffic and also to the importance of knowing more. The Secretary also talked about the importance of knowing more than we do about the deep oceans. Even though we might not be able to make any decision now as to whether or not there should be national sovereignty in the deep seabeds, and even though vesting of jurisdiction in an international body might be inadvisable, I should think that we might establish some rules of the road with respect to the deep seabed, without going so far as to make any decisions about the actual jurisdiction.

What would be wrong about exploring, on some kind of cooperative coordinated basis, these problems, problems as you point out we need to know more about? Would this be interference in some way with what we might consider our national interests, if we should encourage international cooperation and coordination?

Admiral HEARN. Of course, the rules of the road and the convention on the high seas really were a codification of customary international law, a law that had developed by practice and acceptance, over hundreds of years, based upon factual situations as they arose.

We are not equipped, today, to resort to factual situations because we don't know enough about the area to know what the factual problems are going to be. Generally, the law follows the facts. You don't create law in a vacuum in anticipation of what you don't know.

Mr. FRELINGHUYSEN. I am not suggesting that. But we might, in establishing rules of the road, say that the deep seabed should not be used for aggressive military purposes or some such thing. You could

conceive of an undersea installation being put offshore and used as a weapon against another country. Wouldn't it be possible to consider, at this time, neutralizing those areas? I assume the continental shelves already can be used both for defense or quite possibly for offensive purposes and that there are no rules of the road to prevent such a development.

Might it not be declared that the deep seabeds are off limits for such purposes?

Admiral HEARN. You certainly could say it, yes, sir, but I don't know whether it would be in the best interest of our national security to go so far as to commit ourselves to that proposition well in advance of the development of the technical knowledge which will indicate what is in the best interest of our national security.

Mr. FRELINGHUYSEN. Let's get back to the question of developing knowledge. Could we not, on some kind of international basis, develop more knowledge of what is under the sea?

Mr. Secretary, this can be directed to you.

Mr. FROSCHE. I think we are discussing three different things which are intimately associated with each other. One is the question of rules of the road. This deals specifically with how moving ships, whether submerged or not, deal with each other and with fixed obstacles in close proximity. They are essentially traffic rules designed to alleviate dangerous situations and avoid collisions and damage. There is some study going on now as to how the rules of the road which were principally established for surface traffic may be extended to situations that may be somewhat more complicated underseas.

I think that in the long run we will have to codify some legal practice. To date there have been so few actual situations that most of the studies are conducted through experiments in which people postulate various situations and try to work out what might happen. There has been some discussion of this problem in the Coast Guard and some discussion internationally in an organization called the Intergovernmental Marine Consultative organization which is the group that has undertaken most of the rules-of-the-road type of codification. I think over the next few years there will be more consideration of these, essentially, traffic and safety problems.

The second problem is the problem of knowledge which I referred to, and that has principally to do with the nature and properties of the seabed both as a place in which things can be built and as a place in which there are natural resources and objects which might be worth retrieving or exploiting. To proceed to construct legal regimes without having more knowledge of the situations to which the legal regimes would apply would be a fairly dangerous thing to do.

Mr. FRELINGHUYSEN. That was not what I was asking. I was saying, apart from whether or not we should establish a legal regime or an internationally controlled area, isn't it a reasonable proposition to establish general principles of international cooperation and actual practice? As I understand it you have already been participating in such operations.

Mr. FROSCHE. I was going on to say that one of the major series of discussions that we had at the Intergovernmental Oceanographic Commission during the past 2 weeks had to do with the question of

legal problems related to scientific research particularly on the high seas and on the sea bottom. As you may know, the Soviets proposed that this intergovernmental commission undertake the writing of legal conventions to cover the question of scientific work and of resources work on the sea bottom.

Mr. FRELINGHUYSEN. I don't mean to interrupt, Mr. Secretary. You are assuming too much if you think I know that. I don't know what the Intergovernmental Oceanographic Commission is.

Mr. FROSCH. The Commission is a specialized agency under UNESCO which was set up in 1960 in order to provide an international forum in which governments interested in scientific research at sea could discuss with each other problems of scientific research and make arrangements for cooperative research and studies of oceanographic and sea bottom matters. It has met every 2 years since then, and has started and arranged for a number of cooperative studies of oceanographic matters including the International Indian Ocean Expedition and the International Cooperative Investigations of the Tropical Atlantic.

These have been useful scientific expeditions and a good deal of knowledge has been gained through them. This has been a purely scientific intergovernmental group in that it has dealt only with problems of scientific research. The proposal made by the Soviets was that it would be useful for this Commission to undertake the writing of legal conventions for scientific research and for resource exploitation. It was the U.S. view that the charter and the nature of this Commission was quite restricted to scientific research and that the makeup of the Commission was such that it could not undertake something as broad as the writing of legal conventions involving scientific research and the ways in which scientific research impinges upon fisheries problem, upon resources problems, upon economic problems and so on. We finally did, however, agree that it would be useful for this Commission to establish a working group that would try to develop the present status of knowledge with regard to the way in which scientific research is affected by legal possibilities and the way in which scientific research can make a contribution to understanding what the law of the sea might rationally be.

This working group will be appointed by the Bureau of the Commission and will begin to develop this information. One of the previous actions that the Commission took was a request for all States that were involved to submit to the Secretary of the Commission instances in which they had knowledge of legal difficulties which led to problems in scientific research. As far as I know, over the 2-year period since the previous meeting only two such instances were submitted to the Secretary of the Commission, although we are aware of several other instances that might have been submitted. None of them were serious.

Mr. FRELINGHUYSEN. I will have to reread your testimony to understand it. This is no reflection on you, Mr. Secretary. I am not sure yet how a commission such as this operates.

How is the United States represented and how is a U.S. position developed? As I understand you, the Soviets made a suggestion which would have resulted, if it had been accepted by the United States—I gather the United States vetoed it—which would have resulted in

the development of legal conventions with respect to exploitation of the deep seabed, and which would have dealt with questions with respect to scientific research.

Why did we drag our feet on that proposal? How do we arrive at that position?

Mr. FROSCH. Let me answer the two questions in order. We simply felt this particular commission was the wrong forum to develop something as sweeping as generalized legal conventions. The Commission has a charter which is too narrow because it deals only with scientific research. Our agreed upon view, and I will come to the mechanism for that in a moment, has been that something as sweeping as these conventions would have to be undertaken in an international forum which was competent in much broader areas than just scientific research but that it was entirely reasonable for this Commission to offer its services as an intergovernmental body to the wider arena of the United Nations or whatever international organizational part of the United Nations system was proper to undertake that work.

Mr. FASCELL. Will the gentleman yield at that point?

Mr. Secretary, do you mean, for example, the First Committee?

Mr. FROSCH. It could conceivably be the First Committee.

Mr. FASCELL. That is where the issue is right now.

Mr. FROSCH. Yes, sir.

Mr. FASCELL. In your view, is that the right forum or the wrong forum? I think that is an important point.

Mr. FROSCH. I think the First Committee or the U.N. as a whole—whether it is the First Committee or another committee I am not sure—would be the right forum to start the problem out. There is no question that a forum as large as that would discover it would have to refer many questions to a more specialized body.

For example, it is quite clear that the First Committee of the U.N. is not made up in such a way that it is technically competent to deal with scientific matters and perhaps not with agricultural matters or economic matters. So when these areas come up as a part of the decision I think they would have to ask questions of specialized bodies in order to be sure that their basis of fact upon which they were operating was correct.

Mr. FRELINGHUYSEN. I would assume the First Committee would be an inappropriate group inasmuch as it is composed of every member of the U.N. regardless of the country's interest or capacity in this kind of exploration and research. They would be the authorizing group to establish a broader based commission than the one that we have been referring to.

Mr. FROSCH. This seems like a reasonable thing to do.

They might authorize such a commission and they might write some general guidelines as to what this working committee might consider.

Mr. FRELINGHUYSEN. Your objection was not to the fact that there should be some international interest in common approaches to these problems, and a sharing of knowledge and a division of responsibility?

Mr. FROSCH. Not at all but merely a feeling that one had to be quite careful in picking the right international arena so that all aspects of the problem would be suitably considered and represented.

Mr. Gross. Will the gentleman yield?

Mr. FRELINGHUYSEN. Yes.

Mr. GROSS. Mr. Secretary, in referring to a specialized group you are not referring to this First Committee of the United Nations as being specialized in knowledge on this subject?

Mr. FROSCH. No. That is precisely the point. I think they could agree that there was a problem and that the problem was important. They could agree to set up on or several specialized bodies that would have detailed knowledge and they could establish guidance for what it was that they wanted those specialized bodies to do.

Mr. GROSS. Are you through?

Mr. FRELINGHUYSEN. The Secretary was just going to cover the point how a decision is made within this particular Commission as to whether or not to respond favorably to a suggestion from the Soviets.

Mr. FROSCH. The Bureau and Consultative Council of the Commission, the bureau consisting of the President and Vice Presidents of the Commission who are elected by the Commission, the Consultative Council consisting of a group of countries, including the United States, who act as a kind of steering committee for the Bureau, establish an agenda or a provisional agenda for the Commission.

The Commission, itself, adopts its own final agenda. We have the provisional agenda quite a long time in advance of the actual meeting and there is a committee which was originally set up by the old Interagency Committee on Oceanography but which still exists as a committee reporting to the State Department and representing the governmental agencies and some private scientific groups concerned with oceanographic problems. This committee studies the agenda and makes recommendations to the Department of State with regard to the U.S. responses to the various items on the agenda. These proposed—

Mr. FRELINGHUYSEN. I don't mean to interrupt again. I don't understand what we are saying. This is an interagency committee composed of U.S. individuals from a variety of Federal agencies interested in marine matters?

Mr. FROSCH. That is correct, sir.

Mr. FRELINGHUYSEN. They don't have any formal representation on this Commission at all? They are an outside group which makes the decision—

Mr. FROSCH. I am describing the way in which we, internally for the executive department of the U.S. Government, decide upon the policy guidance to be given to the U.S. delegation to this intergovernmental commission.

Mr. FRELINGHUYSEN. It sounds like chaos to me. You as a representative to the Commission do not have the power to decide for yourself what the U.S. position is going to be. That is for the interagency committee.

Mr. FROSCH. Let me complete the cycle.

Mr. FRELINGHUYSEN. I am afraid I will lose track of what we have said thus far.

Mr. FROSCH. The interagency committee makes a recommendation as to U.S. policy response to the State Department. The State Department circulates this formally to the agencies that have U.S. national interests in marine sciences and asks for their views. There is a se-

quence of discussions between State and the agencies until they finally agree upon U.S. policy guidelines as a response to the items on the agenda. By much the same mechanism a delegation is chosen, there are nominations made and the State Department consults with the agencies and finally it is the responsibility of the Department of State to say these are the guidelines of U.S. policy and this is the delegation that has been appointed by the Secretary of State to this intergovernmental commission.

I was appointed chairman of the U.S. delegation to the Intergovernmental Commission. I met in Washington with the members of the delegation appointed by the Secretary of State.

Mr. FRELINGHUYSEN. How many are there?

Mr. FROSCH. There were 15 members.

Mr. FRELINGHUYSEN. Are you also members of this interagency committee that reports to State? How long does this process of making your mind up take? I would think it would take 3 years.

Mr. FROSCH. It took in this case about 6 weeks.

Mr. FRELINGHUYSEN. You are not on the interagency committee that makes the original recommendations to the State Department? They have to gather the responses to those recommendations and then feed them back in a single position paper to you?

Mr. FROSCH. I was not a member of this committee but a number of the members of the delegation were members of the committee. In fact, when we sat down as a delegation, with the papers, essentially everyone who had been responsible for developing a position was present in the room either as a member of the delegation or a representative of the State Department or some agency. As a delegation, we discussed these fully. We had an opportunity to argue about some of the policy matters, some of them were changed, most of them were not because we generally agreed with these policy statements. When the delegation went to Paris we had a set of policy guidelines item by item which we were able to use, essentially as reminders of the policy agreements that we had made before we left.

Within these policy guidelines I had authority from the Secretary of State to respond to anything else that came up at the meeting within my own judgment but I was urged that if I thought something was going beyond policy agreements or might cause a special problem to consult either with our Ambassador in Paris, Ambassador Bohlen, or by cable or by telephone with the Department of State back here. On two occasions I actually did so because I found myself faced with problems which I though might well have implications that were beyond things that I knew.

I was able to make a phone call or send a cable and get immediate assistance and an answer to my question. It all went rather smoothly, I must say, although a good many of the discussions were fairly intricate and the problems are not simple.

Mr. FRELINGHUYSEN. I yield to Mr. Fraser.

Mr. FRASER. Just one question. When you checked from Paris with Washington, from whom did you get the clearance?

Mr. FROSCH. I checked with Mr. David Popper who is the Deputy Assistant Secretary of State for International Organizations. At the time I checked with him he was acting assistant secretary for that purpose, Mr. Sisco being out of town.

Mr. Gross. Admiral Hearn, the title to this House joint resolution is, "expressing opposition to vesting title to the ocean floor in the United Nations." In your statement on page 4 and I am quoting only in part, you say, "What I am suggesting is that actual oceanographic activities will not force us to make a final decision for awhile. In the meantime we are giving careful consideration to all the options."

Are you saying in effect—and I don't want to put words in your mouth—that you support this resolution which would be the sense of Congress that we not vest title in the ocean floor in the United Nations or any other international organization at this time but particularly this resolution?

Admiral HEARN. The point I intended to convey, Congressman Gross, is the fact that we feel at this time it is not appropriate to take any steps which would finalize the regime of the deep oceans. As to the question whether the sense of Congress should be expressed in this regard, it is the opinion of the State Department as I understand the prior testimony that they are opposed to vesting the deep oceans in the United Nations at this time, but they would prefer not to have a resolution. We support the State Department's view because they are the ones that have to deal with the United Nations. I think that the State Department's view is the same as ours with respect to the substance of the resolution.

Mr. Gross. Why would you be opposed to asking, if I am correct in interpreting what you have said, to asking for more time? Why would you oppose this resolution? Some of us are pretty well convinced the move is on to vest too much of this matter in the hands of the United Nations. Why would you be opposed in asking for more time? I am interested because you are a part of the operating U.S. Navy. I would like to hear in a closed session some of the information which apparently is going to be denied us in an open session today. Why would you be opposed to an amendment of this kind?

Admiral HEARN. Because at this time, Congressman Gross, we don't feel there is enough known about the future of the deep oceans not only with respect to their exploration but their exploitation. We feel all the options should remain open until such time as we can make an educated estimate——

Mr. Gross. That is precisely the purpose, one of the purposes of the resolution, Admiral. "Whereas strong efforts are being exerted by certain groups and individuals to immediately place the United Nations in control of the resources of the bed of the deep sea and ocean," and so on and so forth.

Admiral HEARN. My response to that, sir, is that we agree fully with the substance of the resolution but it is the position of the State Department that they would prefer that the resolution not be passed notwithstanding that they agree with the position that the resolution supports.

We support the State Department. It retains the flexibility that we feel essential until such time as we are able to make an educated estimate of what the future interests are.

Mr. FROSCHE. I think it is not a question whether we oppose the resolution. We simply are questioning the necessity for the resolution inasmuch as the statement of the resolution agrees with the position of

the administration as already taken by the State Department. It isn't clear how it adds to or changes this position in any way.

Mr. FASCELL. Except for one thing, Mr. Secretary, and that is, if you pass a sense resolution by the Congress you foreclose an option. That may or may not be desirable. Some people think it is desirable.

Mr. FROSCH. I think the other thing I would say from a Navy point of view is that some aspects of this problem go into areas of U.S. policy that are well beyond the Navy's sphere of action and operation. That is why we do defer to the State Department because they have more general problems in foreign relations to consider than our area of responsibility.

Mr. GROSS. Of course, the operating Navy must be interested more than anything else in the security and protection of this country. I just don't want to find out later that you have agreed with the State Department simply for the purpose of conformance and convenience. We have too much of that around here.

Mr. FROSCH. Mr. Gross we have agreed with the position taken by the State Department because we believe it to be the correct position. It is also essentially the position which is described in the proposed resolution.

Mr. GROSS. I don't quite get that from Admiral Hearn's statement. I will reread it when the reporter transcribes it.

Mr. FASCELL. Mr. Secretary, in connection with the recommendation process, either with respect to the Intergovernmental Oceanographic Commission or with respect to, let's say, the matter that is now on the agenda of the U.N.'s First Committee, what is the interagency committee now called?

Mr. FROSCH. The Committee on Marine Research, Education, and Facilities.

Mr. FASCELL. And it is headed by whom? I am referring to the United States.

Mr. FROSCH. That is the Committee which is essentially the new one that was formed when the Interagency Committee on Oceanography was dissolved. It came about due to changes that were necessary to conform with the new law that established the National Council.

Mr. FASCELL. Would you repeat the name of this interagency committee?

Mr. FROSCH. This is now the Committee on Marine Research, Education, and Facilities.

I have to be careful that we are all talking about the same committee. If you are referring to the one which Mr. Frelinghuysen was asking about which is the one that makes recommendations on policy, that was a subcommittee of the Interagency Committee on Oceanography.

The problem that we faced when the Interagency Committee on Oceanography was dissolved and a new committee was formed because of the law changing the organization, was how to attach the subcommittee properly into the organization. It now reports directly to Mr. Pollack in the State Department who is the Director of Science and Technology and who is also in charge of the Committee formed

by the National Council on Marine Resources in order to take care of problems in international affairs relating to the marine science.

Mr. FRELINGHUYSEN. I don't like to sound any dumber than I am, Mr. Secretary, but which committee reports to Mr. Pollack?

Mr. FROSCH. The Panel on International Programs and International Cooperative Organizations.

Mr. FRELINGHUYSEN. I thought you said it had been dissolved?

Mr. FROSCH. The parent committee of this Panel was dissolved.

Mr. FRELINGHUYSEN. Wait a second. I have lost you already.

Mr. FASCELL. Will the gentleman let me pursue my original thought with respect to chain of command and then perhaps we can straighten it out. We start out with the National Council on Marine Science and Engineering Development, established by law. Is that correct?

Mr. FROSCH. Yes.

Mr. FASCELL. Under that you have a committee which is an inter-agency committee?

Mr. FROSCH. Let me follow that line.

Mr. FASCELL. Let's start at the top and go down.

Mr. FROSCH. We start with the National Council. The National Council has established a number of committees, the committees that falls in direct line for this problem is the Committee on International Policies in the Marine Sciences which is chaired by Under Secretary of State Kohler.

Mr. FASCELL. Does the Committee on International Policies in the Marine Sciences have the responsibility for coordinating and formulating U.S. Government policy on oceanography and other related marine problems?

Mr. FROSCH. As it relates to international affairs; yes.

Mr. FASCELL. They have a subcommittee?

Mr. FROSCH. That is correct. They have a subcommittee which is responsible——

Mr. FASCELL. What is the name of the subcommittee and who heads it?

Mr. FROSCH. The subcommittee is chaired by Mr. William Sullivan who is in the State Department——

Mr. FASCELL. Former ambassador?

Mr. FROSCH. No. The subcommittee is called the Panel on International Programs and International Cooperative Organizations.

Mr. FASCELL. Does the subcommittee have the responsibility for coordinating, formulating, and recommending U.S. agency policy?

Mr. FROSCH. For recommending policy as a result of agency consultation to the parent Committee.

Mr. FASCELL. They report to the National Council?

Mr. FROSCH. They report to the parent Committee headed by Mr. Kohler.

Mr. FASCELL. Is that the chain of command with respect to you, as an Assistant Secretary, who is a delegate on the Intergovernmental Oceanographic Commission, for example? Or do you have a different chain of command for that purpose?

Mr. FROSCH. For the purpose of being a delegate to the Intergovernmental Commission, the fact that I am an Assistant Secretary is incidental. I am for that purpose an appointee of the Secretary of State

to represent the United States. I received my instructions from the Deputy Assistant Secretary of State——

Mr. FASCELL. I recognize that. Every international delegate would get his instructions from the Secretary of State.

Mr. FROSCH. But the instructions that I received were those generated by the mechanism of the subcommittee reporting to the Committee on International Policy in the Marine Sciences.

Mr. FASCELL. Now we have gone through that hurdle.

Mr. FRELINGHUYSEN. I don't know whether we have gone over the hurdle I raised or not. I have almost lost track of my question during this exploration of the organization chart. What is the group that reports to Mr. Pollack? This nameless subcommittee?

Mr. FROSCH. We are still calling it PIPICO—Panel on International Programs and International Cooperative Organization.

Mr. FRELINGHUYSEN. Maybe this whole discussion should have been in executive session.

Mr. FASCELL. Have you finished? I would like to continue with what I was after.

Mr. FRELINGHUYSEN. I am certainly not through but by all means——

Mr. FASCELL. Go ahead.

Mr. FRELINGHUYSEN. You are pursuing a thought.

Mr. FASCELL. What I am trying to find out now is, was this standard operating procedure, with respect to arriving at a position, this actually followed with respect to the position that you arrived at on these resolutions and that you are presenting here today?

Mr. FROSCH. Yes.

You are asking with regard to these resolutions as opposed to the position with regard to the Commission?

Mr. FASCELL. I am asking with regard to your position on the matter on which you are testifying today.

Mr. FROSCH. You see we went off into a digression from the resolutions discussing the Intergovernmental Commission. That is a separate matter. With regard to my testimony here today on the resolution, I am appearing as Assistant Secretary of the Navy and my position was arrived at as a Navy position.

Mr. FASCELL. Does the same subcommittee which attempts to coordinate and formulate U.S. interagency position for international affairs try to do it for purely domestic positions, which is what you are doing here today?

Mr. FROSCH. No.

Mr. FASCELL. There is no interagency committee then with respect to purely domestic position?

Mr. FROSCH. There are committees which are under the National Council, but that is a separate committee mechanism.

Mr. FASCELL. I am talking about these resolutions or any other similar position so presented in the Congress of the United States, for example, that deal with oceanography or other related subjects.

Mr. FROSCH. These resolutions deal with international problems. So the Committee on International Policy in the Marine Sciences has been coordinating agency positions on this.

Mr. FASCELL. And all the agencies agreed to the same position?

Mr. FROSCHE. The agencies have pretty well agreed on this one. I think there was no difficulty in coordinating positions because everybody had about the same position.

Mr. FASCELL. Has that position been submitted to the National Council and was it approved by them?

Mr. FROSCHE. It has been discussed by the National Council.

Mr. FASCELL. Not formally acted on?

Mr. FROSCHE. I believe acted on and approved. I would have to go back and look at the minutes of the meeting.

Mr. FASCELL. That would be interesting if that were the case.

Would you make the same statement with respect to the statement that our representative will make at the U.N. in the First Committee?

Mr. FROSCHE. I think the position that the delegation was instructed to take—

Mr. FASCELL. You are talking about the U.S. delegation?

Mr. FROSCHE. Yes, to the U.N., was agreed upon at least in outline by the National Council. It was presented to the National Council by Under Secretary Kohler and was agreed to by the Council. I say in outline because he presented the substance of what the position would be, not the entire document.

Mr. FASCELL. Mr. Secretary, when did that happen? This is the first time that we have had this testimony.

Mr. FROSCHE. I believe it was at the last meeting, or the meeting before, which would have been a couple of months ago. September I think.

Mr. FASCELL. That is interesting because we didn't know that this matter was receiving anybody's attention at that time. As a matter of fact, we heard exactly the opposite. The reason why I am pursuing this line of inquiry is that there apparently has been no meeting of the National Council on this subject at all. I am curious—it is a natural curiosity I am sure you can understand—as to how we happen to have a unified position and yet the matter has never been acted upon, if such is true.

Mr. FROSCHE. There was not a special meeting of the National Council for the purpose. This was an agenda item—

Mr. FASCELL. It was necessary to hammer out a position. A position had to be discussed and agreed upon.

Mr. FROSCHE. That was done at a lower level—the hammering out of a proposed position was done at levels below the National Council and the National Council agreed with the presented position.

Mr. FASCELL. Normally, in the course of events, that would be presented to the State Department as the U.S. position or at least a recommendation on the U.S. position.

Mr. FROSCHE. As it appeared at the Council it was a recommendation from the Secretary of State to the Council as the result of his coordination with the various agencies. When the Council approved it, they were giving their approval back to the Secretary of State.

Mr. FASCELL. What is your recollection of the guidelines of policy which were approved?

Mr. FROSCHE. I would have to go through that. I think some of it still is regarded as classified. I would be happy to take it up in executive session.

Mr. FASCELL. I am not really concerned at this point with the classified aspects of it because we will go into executive session to pursue this. With the announced position which the State Department has testified to and other agencies have testified to——

Mr. FROSCI. The position and guidance was essentially that to which I have testified and others have testified; namely, that we are opposed to the substance of the Malta resolution. The part that I would prefer not to discuss in open session are any specific positions that we might want to take in opposition to it.

Mr. FASCELL. For example, to be specific, was there any determination with respect to U.S. position on a Decade of International Development and Research?

Mr. FROSCI. The subject has been discussed. There was no final determination.

Mr. FASCELL. Thank you.

Are there any other questions?

Mr. GROSS. Yes, Mr. Chairman. I am still far out at sea with respect to the order of authority. There is a National Council. Is this No. 1? You originally said that the Committee on International Affairs was the No. 1——

Mr. FROSCI. No; that is a committee that works for the National Council.

Mr. GROSS. Then the National Council is the top-rated—is that true or untrue?

Mr. FROSCI. That is true with regard to marine science affairs.

Mr. GROSS. National Council of what?

Mr. FASCELL. The National Council on Marine Resources and Engineering Development. Let's use the whole title.

Mr. GROSS. This is No. 1 in the line of authority. Then No. 2 is this right, is the Committee on International Affairs?

Mr. FROSCI. Yes.

Mr. GROSS. Which has a subcommittee headed by William Sullivan of the State Department. Then there is an international governmental committee?

Mr. FROSCI. The Intergovernmental Oceanographic Commission is not a U.S. Government object at all. It is an organ of the United Nations Education and Social and Cultural Organization.

Mr. GROSS. Where does that rate in the setup of the National Council and the Committee——

Mr. FROSCI. It isn't part of that organization whatever. It is an international organization to which the United States of America sends a delegation.

Mr. GROSS. The same can be said of the International Programs Committee, is that correct, that it is not a part—doesn't take any place in the order——

Mr. FROSCI. I am not sure I know what you are referring to.

Mr. FASCELL. You have come up with a new commission.

Mr. FROSCI. That is the subcommittee of the International Affairs Committee. That is PIPICO.

Mr. FRELINGHUYSEN. What is that?

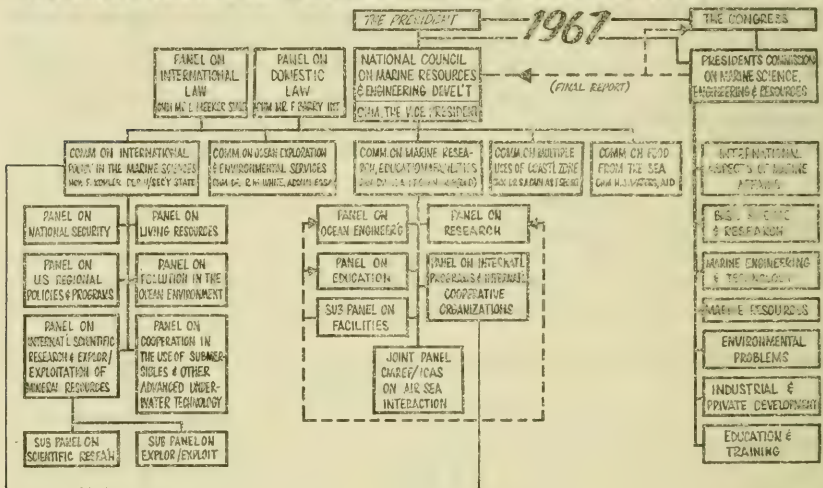
Mr. FROSCI. That is a handy way of referring to it.

Mr. FRASER. Are those the initials?

Mr. FROSCHE. Yes; Panel on International Programs and International Cooperative Organizations.

(The following chart was submitted during the course of the hearing:)

MARINE SCIENCE AFFAIRS in the FEDERAL GOVERNMENT



NOTE: Chairman, Committee on International Policy in the Marine Sciences plans to consolidate panel structure

11 October 1967

Mr. GROSS. I am beginning to understand, Mr. Chairman, why they have an addition to Fort Fumble, otherwise known as the Pentagon, being built in Southwest Washington. It must take quite a little space. Where do you get the funds for all this business?

Mr. FROSCHE. For which business? For the operation of the committees?

Mr. GROSS. For the National Council, the Committee on International Affairs, and so forth.

Mr. FROSCHE. The Congress appropriated—

Mr. GROSS. Out of the defense appropriation or what?

Mr. FROSCHE. The Congress appropriated funds for the operation of the Council—

Mr. FASCELL. You are a bit modest. You might as well mention that the Council was created last year by the Congress.

Mr. GROSS. I have no doubt that it was created by Congress. We create a lot of things over here. They cost a lot of money. I would like to know where you are getting your money. You have a lot of people wandering around over the world, apparently, junketing and one thing or another in this deal. Tell me something about it.

Mr. FROSCHE. The funds for the National Council and its committees and staff were appropriated by the Congress specifically.

Mr. GROSS. Through the DOD appropriation?

Mr. FROSCHE. No; I believe as a separate appropriation to the Office of the President.

Mr. GROSS. I will be looking for those line items in the next appropriations bill I can guarantee you.

Mr. FROSCH. With regard to the representation at the Intergovernmental Oceanographic Commission, that is an international organization to which the United States belongs, and I believe the U.S. membership in that organization was approved by the Congress and consequently delegation and representation to it is paid for by State Department funds appropriated for the purpose.

Mr. FASCELL. Mr. Fraser.

Mr. FRASER. I have been rereading the Malta resolution. The first principle that is embodied in the resolution says that the seabed and the ocean floor underlying the seas beyond the limits of present international jurisdiction are not subject to national appropriation in any manner whatsoever. Is that the part of the resolution that you disagree with?

Mr. FROSCH. It is a part of the resolution that I don't think I understand. Because I don't know what the ramifications of "in any manner whatsoever" are.

Mr. FRASER. If you don't understand it how can you have a position on it?

Mr. FROSCH. Because I can think of some things that it could be taken to mean and may be taken to mean that I would strongly oppose.

Mr. FRASER. Isn't this a matter that would be developed through discussion and redrafting and so on?

Mr. FROSCH. It might be. It could go in any number of directions.

Mr. FRASER. I have been reading the statement by Ambassador Goldberg and I don't find him in his initial statement doing anything except agreeing that the subject matter is one of importance, that it needs to be studied, that he supports the inscription of the item on the agenda, and it should have early consideration by the First Committee. Nowhere do I find a statement either pro or con on the resolution itself, but only an agreement that the subject matter is of some importance. Is that in substance your position.

Mr. FROSCH. I would agree the subject matter is of some importance. The question of what will the future use and understanding and exploration of the sea bottom be, I think that is an important subject.

Mr. FRASER. Your position on the Malta resolution itself is based on the fact that you don't understand it and that it might be subject to interpretations with which you would—

Mr. FROSCH. No, what I stated was that I don't understand all of the one phrase you read. There are lots of other things in the Malta resolution that are, I think, fairly specific and one could clearly find things in them to oppose, and which I do oppose.

Mr. FRASER. It would be helpful if you could detail that for us.

Mr. FROSCH. Certainly. The memorandum—

Mr. FRASER. I am referring to the memorandum because that is the only thing—

Mr. FROSCH. The memorandum, for example, on page 2 in paragraph 1 states that—

The seabed and ocean floor, underlying the seas outside present territorial waters and/or the continental shelves, are the only areas of our planet which have not yet been appropriated for national use, because they have been relatively inaccessible and use for defense purposes or the economic exploitation of their resources is not technologically feasible.

That is an incorrect statement as a matter of fact. I would prefer to deal with some of the details of it in closed session.

Mr. FASCELL. I think it is common knowledge that many countries of the world are using the deep ocean bed and other parts of the ocean for military reasons.

Mr. FROSCH. Yes, I think that is correct. I think the item under paragraph 3(c) is an area which does not deal directly with the military problems so I only have a personal opinion on it rather than a professional opinion, and it has some very great difficulties in it.

Mr. FRASER. 3(c) ?

Mr. FROSCH. Yes.

Mr. FRASER. That reads:

The use of the seabed and of the ocean floor, underlying the sea beyond the limits of present national jurisdiction, and their economic exploitation shall be undertaken with the aim of safeguarding the interests of mankind.

Mr. FROSCH. That doesn't say anything in particular. The second half—

Mr. FRASER. "Exploitation of the seabed and of the ocean floor shall be used primarily to promote the development of poor countries."

Mr. FROSCH. That could have some political difficulty and some peculiar economic consequences. As a matter of personal opinion, if I set out to write a phrase that if enacted by the United States would slow down the exploitation of the seabed for the longest possible time that is the phrase I would write. In fact the whole resolution would be most likely to have precisely that effect.

Mr. FRASER. To slow down the exploitation?

Mr. FROSCH. Yes.

Mr. FRASER. On the theory of what?

Mr. FROSCH. On the theory of who is likely to invest if he cannot profit.

Mr. FRASER. I don't know about that. We have some big, extensive ore bodies in my State and the steel companies have found it enormously useful to pay the State royalties where the ore body has been found under State land. That money has gone to support our schools. It has been a good deal for everybody. There has been no hesitation in their exploiting it even when it involves State-owned lands.

Mr. FROSCH. I presume the steel companies are exploiting that ore and making money from it although they may also be paying a very useful royalty to the State. That is under a fairly explicit set of conditions.

Mr. FRASER. I assume this kind of concept must be involved. Nobody will do anything if there is no profit in it.

Mr. FROSCH. I am not making that assumption because I have heard a number of interpretations of the paragraph that don't involve that clearcut or legal situation. We have some problems with item D also under 3 because peaceful purposes in perpetuity is so sweeping that it is unclear what it allows and does not allow.

Mr. FRASER. Do you have a detailed analysis of this resolution and the problems that you would raise with it, of the kind that you have been indicating here?

Mr. FROSCH. No, I don't think I do. I am sure such an analysis exists. I have seen several but I have not developed one.

Mr. FRASER. Is there one that represents any kind of official policy position?

Mr. FROSCHE. I believe there is one.

Mr. FRASER. It would be helpful, Mr. Chairman, if we could get that. If it is a classified nature——

Mr. FROSCHE. I think it would have to come from the Department of State.

Mr. FASCELL. We will get it from the Department of State.

(The material referred to is in the files of the subcommittee.)

Mr. FASCELL. Admiral Hearn, before we go into executive session, I want to ask a question.

In the resolution, H.J. Res. 816, language is used that any action at this time would be premature but it uses this wording, "to vest control of deep ocean resources." It further goes on to say that the delegates of the U.N. should "oppose any action at this time to vest control of the resources of the deep sea."

In one case it talks about vesting control of "deep ocean resources" in an international body and in the other case it refers to the "deep sea." In no case does the language cover jurisdiction of the deep seabed.

Is there a legal difference in your opinion and, if so, what is it?

Mr. FROSCHE. I believe the deep oceans and the deep sea can be interpreted to mean the same thing.

Mr. FASCELL. How about the "resources of the deep sea" and the "resources of the deep ocean"? Are they the same as the "deep seabed"?

Admiral HEARN. The resources could be those that lie free on the ocean bottom or located in the subsoil. I think there is a difference between resources in the subsoil and on the seabed, itself.

Mr. FASCELL. Is there a difference between resources, either on top or in the subsoil, and title to the bed itself, or to sovereignty over the bed, or jurisdiction of the bed?

Admiral HEARN. There are lots of differences.

Mr. FASCELL. I would think so. If you oppose vesting of the resources, it doesn't necessarily mean you might oppose vesting of jurisdiction or vesting of the title or any other legal regime.

Admiral HEARN. As to our interest in the continental shelf, we don't have complete sovereignty over the continental shelf. We have sovereignty for the specific purposes of exploring and exploiting the natural resources of the shelf.

Mr. FASCELL. That is an interesting viewpoint because I am sure that many of my colleagues are of the opinion that the United States actually owns the continental shelf to the limits fixed, whatever they were. Now there seems to be some doubt on this under the International Convention on the Continental Shelf.

Admiral HEARN. I think the Secretary may have the Continental Shelf Convention here.

Mr. FASCELL. If it is your legal opinion that the United States does not really have title and that we have jurisdiction or use purposes for only specific uses set forth in the convention, then I think we ought to make that quite clear because I am sure some of us have operated under a misconception.

Admiral HEARN. Let us see if I can find the article I have in mind.

Mr. FRASER. Mr. Chairman, on that point I suppose that there is

the right of free navigation beyond the 3-mile limit over the continental shelf. So it is like that old theory of property rights that they represent a bundle of interests, and that these are a few of the sticks of the bundle that fall one way and a few fall the other way.

Mr. FASCELL. I don't know what that means, if the gentleman will permit me to say, but I know what title is and I know what sovereignty is.

Mr. FRASER. I mean that property rights represent an assortment of specific rights.

Admiral HEARN. There is a big distinction between title and sovereignty and jurisdiction. The first paragraph in article II of the Continental Shelf Convention reads as follows: "The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources."

Mr. FASCELL. You have a limitation on sovereignty in the international convention to which the United States has already agreed?

Admiral HEARN. Yes, sir.

Mr. FASCELL. You have an entirely different concept when somebody goes out and plants a flag at the mid line of the deep ocean and says that under international convention we have a right to do that because we own it. That is an incorrect assumption, is it not?

Admiral HEARN. Yes, sir.

Mr. FASCELL. It is an incorrect legal position, as a matter of fact, because the United States has already agreed to the contrary. Therefore, if the Congress were to act on language which said "oppose vesting control of the resources of the deep sea," we may not be accomplishing anything.

Admiral HEARN. Say that again?

Mr. FASCELL. "Resolved that the Congress of the United States memorialize the President"—I would want to question that language some other time—"to instruct American representatives of the United Nations to oppose any action * * * to vest control of the resources of the deep sea beyond the Continental Shelves of the United States."

That is the proposal to "close the door and stop us from giving everything away." I am just wondering how effective it really is.

Admiral HEARN. Of course, I think if you have an international convention which would turn over to the United Nations jurisdiction over the resources or control over the resources, they would have the exclusive right to exploit them by license to those who they wanted to grant licenses to.

Mr. FROSCH. I see another problem with the wording, Mr. Chairman, that I hadn't seen before. That is, that it is phrased "any action at this time to vest control of deep ocean resources in an international body would be premature and ill advised."

I am not sure what the legal meaning of deep ocean resources is, but to this nonlawyer it does not mean only the sea bottom, it means all resources in the deep ocean. That includes fish. The United States already is a signator to a number of international conventions that deal with the control and conservation of fish and fishing resources.

Mr. FASCELL. It also means water. It means whatever you can extract from the water.

Mr. FRELINGHUYSEN. Since we are analyzing the resolution in such detail would you comment on the language "any action at this time

* * * would be premature"? Doesn't that mean at another time it might be the appropriate thing to act? All we are saying and all you are really saying is that we don't know enough at this moment to take any steps. I don't think you can argue really with the soundness of that position.

Mr. FASCELL. Does that include a resolution by the Congress?

Mr. FRELINGHUYSEN. A resolution by Congress now saying any action at this time would be premature to my mind would be an indication that we would be receptive to such a thing at a later date. I am not saying that we shouldn't have a statement of general principles as to what we think should be done as to the deep.

Mr. FASCELL. That is why I am inquiring about the meaning of such words as "deep ocean resources" and trying to differentiate between "title," "jurisdiction," and "sovereignty" and what our rights are under the International Convention on the Continental Shelf. If we are going to take a position as a Congress I would think we would have to explore all of these and understand them thoroughly before we—

Mr. FRELINGHUYSEN. We didn't do much exploration before we passed that cotton bill yesterday.

Mr. GROSS. What, precisely, is deep ocean?

Admiral HEARN. Deep ocean would be the areas beyond the continental shelf. I think that is the way they would want to construe this.

Mr. FASCELL. Is that the same as the deep sea bed?

Admiral HEARN. I think we are talking in generalities.

Mr. FASCELL. No, we are not either, sir. We are not talking in generalities.

Mr. FRELINGHUYSEN. It seems to me some of the areas beyond the Continental Shelf are already covered by the convention to which we are a party. Those areas beyond the shelf which are subject to exploration are covered. We are in the deep sea bed already to a degree, and this may result in conflicts between national interests. This is why this matter of the deep seabeds is of concern. To what extent does that kind of competition, the technical capacity to get beyond the Continental Shelf, result in what might be an undesirable struggle for power in a new area. And mightn't this mean that we ought to establish some rules of the road? That obviously is not the expression because that has a specific meaning. To what extent is it not desirable at least to try to see where we are going and see if we want to define some general principles. I assume this is what Ambassador Goldberg is going to be arguing for. Let's take a good look at what the nature of the problem is in order to have an understanding of what we are doing before we consider the advisability of trying to develop a convention.

Mr. FASCELL. Gentlemen, we are going to go into executive session now. I want to thank you very much for discussing this matter on the record with. You have made a very significant contribution.

Before we proceed further, however, I should like to place in the record a letter to me from the Vice President of the United States, dated October 27, 1967, on the activities of the Federal Government pursuant to the Marine Resources and Engineering Development Act of 1966. I also expect to receive a report on the activities of the Com-

mission on Marine Science, Engineering and Resources, by Dr. J. A. Stratton, Chairman of the Commission, which will follow in the record of these hearings.

(The letters referred to follow:)

THE VICE PRESIDENT,
Washington, October 27, 1967.

HON. DANTE B. FASCELL,

Chairman, Subcommittee on Organizations and Movements, Committee on Foreign Affairs, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: As Chairman of the National Council on Marine Resources and Engineering Development, I am pleased to respond to your invitation to report to the Subcommittee on International Organizations and Movements of the Committee on Foreign Affairs on the activities of the Federal Government pursuant to the Marine Resources and Engineering Development Act of 1966.

The legislation was developed almost entirely through Congressional initiative and this first year of operating experience has confirmed the soundness of the organic Act, Public Law 89-454, and the amendment that established Sea Grant Colleges and Programs. The legislation singled out international cooperation for particular emphasis in recognition of new opportunities to work with other nations in using the seas to advance world peace, understanding and economic development at home and abroad.

Shortly after signing Public Law 89-454, the President asked me to activate the Council and assume the statutory responsibility to advise and assist him in marine science affairs. The President asked not only for action, but for immediate action. He requested that the Council submit both budget and legislative recommendations that could be embodied in his FY 1968 program. He also assigned to the Council the responsibility of preparing the annual report describing Federal marine science activities and budgets.

The President's initial recommendations set forth in his report to the Congress in March reflect our awareness that the benefits of the sea can and must increasingly serve the needs of our growing and increasingly urbanized society—the needs for food, minerals, energy, and recreation; for commerce and economic growth; and for strengthened national security and improved international understanding.

Let me briefly review some of these challenges that face our Nation and the world today:

There are one and one-half billion hungry people in the world. The full food potential of the seas, seriously neglected in the past, must be realized to combat famine and despair. Technologies now at hand can be directed toward increasing the world's fishing catch and enriching the diets of the underfed.

Seventy-five percent of our population lives along our coasts and Great Lakes. Nine of our fifteen largest metropolitan areas are on the oceans and Great Lakes and three are on ocean tributaries. Twenty million children live on these metropolitan areas within sight of potential water recreation areas but are often denied their use. Only three percent of our ocean and Great Lakes coastline has been set aside for public use or conservation.

More than 90 percent by value of our intercontinental commerce travels by ship. Although there have been rapid changes in the character of ocean cargoes and technologies of cargo handling, the average age of our port structures is 45 years and the average age of our merchant ships is 19 years.

The continuing threats to world peace require our Navy to maintain a high level of readiness and versatility through a sea based deterrent and undersea warfare capability. Middle East conflicts following closure of the Gulf of Aqaba vividly emphasize the urgent need for a strengthened code of international law of the sea.

Thirty million Americans swim in the oceans, eleven million are saltwater sport fishermen, and eight million engage in recreational boating in our coastal states, yet industrial wastes being dumped into ocean tributaries will increase seven-fold by the year 2000 unless there are drastic changes in waste handling.

Ocean-generated storms cause millions of dollars of damage annually along our coasts, but marine weather warning services are available to less than one-third of our coastal areas.

During the past year I have discussed these challenges with scientists, engineers, business leaders, and local, State, and Federal officials here in Washington, at oceanographic installations in nine coastal states, and in the capitals of six countries of Western Europe and one in Asia. These discussions have vividly reflected that these challenges are of concern not only throughout the United States but also throughout the international community.

For seven years, the Congress and the scientific community have insisted on more intensive action to reap the benefits of the sea. Now the Administration is responding to the Congressional mandate—building on long-standing capabilities within eleven Federal departments and agencies and accelerating our progress with a new enthusiasm and determination, a new sense of direction and momentum. We are:

- Identifying goals, and milestones to reach these goals;

- Setting priorities;

- Developing purposeful programs to bring our ocean interests into balance with our overall national interests;

- Clarifying agency responsibilities to develop individual and collective capabilities; and

- Mobilizing our resources—Government, academic, and industrial.

We singled out a number of marine science areas for particular emphasis during FY 1968, and by concentrating diverse projects on a selected number of objectives have begun to obtain a greater effect from a still modest enterprise. We are critically examining the opportunities for FY 1969, realizing that current actions will significantly affect the course we chart during the next several years.

Certain of these programs are the responsibility of a single agency; but increasingly, new programs cross agency lines. The Council is taking steps to prevent unnecessary duplication and to ensure that program gaps do not occur. The areas identified for priority attention during FY 1968 are:

- A new "Food-from-the-sea" program as part of the war on hunger, including overseas demonstration projects utilizing fish protein concentrate;

- Immediate implementation of the Sea Grant program to strengthen education, applied research and information transfer;

- A new study for improved collection and dissemination of oceanographic data;

- Designation of the Chesapeake Bay as a model to study the effects of estuarine pollution and remedial measures;

- A pilot plan for offshore minerals exploration;

- An expanded ocean observation system to improve near-shore weather prediction for small boats and oil facilities and accuracy of long-range forecasting;

- A strengthened program of deep ocean technology especially to develop a future capability to recover lost equipment;

- A new ship to accelerate research in sub-Arctic waters; and

- Programs for international cooperation to promote peaceful use of the oceans.

Since formulating these Fiscal Year 1968 recommendations, the Council has studied a number of separate policy and program issues. Those made public concern such matters as the marine resources resolution introduced last fall at the United Nations General Assembly calling for examination by the Secretary General of international marine science activities; initiatives for Latin American cooperation announced by President Johnson at Punta del Este; a joint study by the Departments of Interior and Transportation concerning TORREY-CANYON-type pollution incidents; a recommendation that the Navy's Transit satellite system be made available for oceanographic and commercial ships and that the Department of Transportation be assigned responsibility to develop plans for an updated national navigation plan for civilian use. Additionally, we anticipate that during the next few days we shall make constructive suggestions at the United Nations regarding the further evolution of the law of the sea.

Where policy or program activities cross agency lines, and are of continuing nature, it has been desirable to develop proposals for Council action through a committee structure. These have been established on a selected basis as the minimum necessary to achieve purposes of the Council. These committees concern:

- (1) Marine research, education and facilities.

- (2) International policies.
- (3) Exploration and environmental prediction services.
- (4) Multiple use of the seashore.
- (5) Food from the sea.

We are fortunate to have a close association with the advisory Commission on Marine Science, Engineering, and Resources. While the Commission and the Council are independent, we are at the same time working harmoniously together toward common goals. We are looking forward to the Commission's recommendations to the President and to the Congress concerning a national plan and the most appropriate future structure of the Federal Government to carry out statutory purposes.

Most of the mysteries of the sea remain cloaked before us. Most of its resources remain untapped. Most of its potential to serve national goals remains unawakened. To realize this opportunity depends on a creative partnership of our Federal Government with States, with universities and research organizations, and with industry.

We recognize the intensified use of the sea, now projected world wide, could very well stimulate national rivalries and conflicts that could arrest the development of marine resources and defeat the very purpose of our national policy. It is, therefore, essential that we work with all countries, from East and West, bilaterally and through international organizations, in exploring, understanding and using the seas and their resources. Together with the advanced nations we can jointly explore ocean resources. We can assist the less developed countries to promote coastal development, open new waterways and strengthen food economies, thus promoting economic growth and political stability.

Since the founding of the United Nations this country has played a leading role in mobilizing international interests in preserving and promoting peace through this world forum. The increasing interest in marine activities of many UN bodies such as the Food and Agriculture Organization and the Intergovernmental Oceanographic Commission reflect the international character of oceanic endeavors.

As we continue our efforts in these bodies, at the top of our list of priorities remains the necessity to mobilize the efforts of many countries to tap the abundant unused food potential of the oceans, for the world's food supply stretches thinner and thinner in the face of a spiralling population. We also anticipate developments in other areas of marine technology which will provide new opportunities for strengthening maritime ties. For example, the deployment of unmanned ocean stations for collecting environmental data can benefit many nations.

Pure logic and practical economics dictate this program. However, not to be forgotten is man's compelling desire to explore and to understand the world around him. The spirit which has carried us to rugged mountain peaks, remote polar icecaps, and distant reaches of outerspace now propels us to the ocean deeps. This spirit is fortified with a confidence developed by past contributions of science that we will not only conquer the ocean deeps but will use them in satisfying the needs of our society.

In concluding, I would like to express my appreciation for the interest by the Congress in what is both an enormously complex set of issues and an untapped set of opportunities to study and utilize the sea to serve man. This program is supported by both Executive and Legislative branches of Government, free of partisan controversy, and I look forward to our working further with the Congress in serving our mutual interests.

Sincerely,

HUBERT H. HUMPHREY.

COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES,
Washington, D.C., November 15, 1967.

HON. DANTE B. FASCELL,
Chairman, Subcommittee on International Organizations and Movements, House Committee on Foreign Affairs, Rayburn House Office Building, Washington, D.C.

DEAR MR. FASCELL: This is in response to your staff's request for a summary of this Commission's responsibilities and activities.

The Marine Resources and Engineering Act of 1966 (Public Law 89-454), which authorized the Commission's establishment, sets forth various goals for a

national marine science program. These goals include the development of marine resources, expansion of knowledge of the marine environment, encouragement of private investment in marine enterprise, advancement of education in marine sciences, and cooperation with other nations when such cooperation is in the national interest. It is the Commission's responsibility to recommend a national oceanographic program adequate to achieve these goals.

Under Public Law 89-454, the Commission is specifically charged with:

- (1) examining the nation's stake in the development, utilization and preservation of our marine environment;
- (2) reviewing all current activities in the broad domain of marine science, as well as those contemplated for the future, and assessing their adequacy in meeting the specified goals set forth above;
- (3) on the basis of these investigations, formulating a comprehensive, long-term, national program for the marine sciences designed to meet present and future national needs in the most effective possible manner; and
- (4) recommending a plan of governmental organization best adapted to the support of the program.

The Council and the Commission are complementary bodies, although in certain areas their interests inescapably overlap. The members of the Council represent at the highest level the major Federal departments and agencies concerned with marine affairs. The Council is directly concerned with current matters. It bears the responsibility of coordinating marine programs and of advising and assisting the President on a continuous basis. However, since it is also charged with the shaping and strengthening of Federal programs for the oncoming budgetary years, it must also initiate new activities and engage in extensive surveys and forward-looking studies.

By contrast, the Commission is wholly free of operating responsibilities. Our members represent diverse interests and areas of the country. Three are drawn from the Federal Government, one is Commissioner of Fisheries in the State of North Carolina, and the remainder have associations with industry, with academic institutions and the professions, and with organizations engaged in marine science and technology. We are aided in our task by four Members of Congress, who serve as our advisers: from the House of Representatives the Honorable Alton A. Lennon and the Honorable Charles A. Mosher; from the Senate, the Honorable Warren G. Magnuson and the Honorable Norris Cotton. We are fortunate in the support of a small but excellent staff, drawn as was the Commission from diverse fields and backgrounds. And to insure that we do not perpetuate ourselves, the enabling Act prescribes that we shall cease to exist thirty days after the submission of our report.

In return for freedom from day by day involvement, we recognize that the Congress and the President await from the Commission a wholly detached assessment of the national effort in marine affairs, viewed from the standpoints of science, technology, economics, security, and the quality of our national life. Upon this basic evaluation of needs and resources, the Commission must endeavor to formulate a national plan for the future which will embody both vision and realism.

Clearly the task is one of enormous hardwork and complexity. Because it will be impossible for each individual member of the Commission to become familiar with every aspect of such a task, we have resolved ourselves into panels, each charged with a mastery in depth of some particular area. The rationale for any such breaking up into task forces is obviously arbitrary, and we have chosen to organize our inquiry under the seven following headings:

1. The level and quality of scientific effort—an examination of research, physical and biological, on the marine environment.
2. The level and allocation of national effort devoted to marine engineering and technology, with special attention to the respective roles of industry, and of the state and federal governments.
3. An inventory of marine resources—chemicals, minerals, and food—examined with a view to potential as well as present abundance and economic availability.
4. The combined environment of air—water—land viewed as a system, including problems relating to the advancement of meteorology, the conservation of shore lines, and the pollution of estuaries.
5. The current level of private investment in marine exploration, technological development and the utilization of resources, with particular

concern for means to encourage private enterprise through investment incentives, legal measures, and technical assistance.

6. International aspects and problems relating to the future development of the total marine environment.

7. The current state and adequacy of education and training to meet the needs of marine science and technology.

Each panel is composed of from two to four members of the Commission with professional staff and consultant support. Hearings and conferences are being held throughout the country to afford ample opportunity for an expression of views on the state of the marine sciences and their future needs. Several panels have in addition plans to send inquiries to selected individuals and organizations to solicit their informal opinions, and a program of interviews has been undertaken with outstanding scientists, engineers, economists, industrialists, educators and legislators on one aspect or another of marine problems.

The Commission has been meeting as a whole two days of each month. The results of panel activity are now beginning to flow in and to provide the basis of our broader discussion. Our most difficult and pressing task at this juncture is to sharpen and to reduce in number the key issues to be dealt with in our final report. The range and variety of questions with which we must come to grips can be illustrated by the following abbreviated list:

1. What is the significance of the oceans to national interests? Should the United States undertake major new programs of research and development to meet economic, political, military or scientific needs in the marine environment?

2. What can be done to enlist private capital and initiative more effectively in the development of marine resources? Do new technologies offer a basis for the development of new industries which will prove to be both competitive and self-sufficient?

3. Are the prospects of significant advances in environmental prediction and control sufficient to warrant at this stage a major investment in the research and observation necessary for the understanding of land, air, and sea as coupled system?

4. What roles should be assumed by local, state, interstate, national and international bodies in managing the use of off-shore lands and waters?

5. What can be done to direct the development of ocean resources as a positive force for fruitful relations among nations rather than a continuing source of friction and conflict?

6. What organizational changes and initiatives are necessary to achieve our objectives?

The Commission harbors no illusion that it can provide final answers to these or to a multitude of other related questions. Indeed Public Law 89-454 itself was envisaged by the Congress only as a first step. But we have proceeded far enough to have confidence that over the coming months we shall succeed in outlining the salient features of a comprehensive plan for the more effective development of marine science and engineering, and in recommending how the utilization of our resources can best be managed.

Enclosed is a list of the 15 members of the Commission and the four Congressional advisory members.

Sincerely yours,

J. A. STRATTON, *Chairman.*

COMMISSION ON MARINE SCIENCE, ENGINEERING, AND RESOURCES, WASHINGTON, D.C.

The members of the Commission are:

Dr. Julius A. Stratton, Chairman of the Board, Ford Foundation, New York, (Chairman).

Dr. Richard A. Geyer, Head, Department of Oceanography, Texas A&M University. (Vice-Chairman)

David A. Adams of North Carolina, Chief of Commercial and Sport Fisheries, North Carolina.

John H. Perry of Florida, President of Perry Publications and inventor of Perry Cubmarine.

Taylor A. Pryor of Hawaii, Director of Sea Life, Inc., and founder of Hawaii Oceanic Foundation.

Jacob Blaustein of Maryland, former President and co-founder of American Oil Company, and Director, Standard Oil Company, Indiana; and former U.S. delegate to the United Nations.

James A. Crutchfield of Washington, Professor of Economics (Fisheries), University of Washington.

Leon Jaworski of Texas, Attorney.

John A. Knauss of Rhode Island, Professor of Oceanography at the University of Rhode Island.

George E. Reedy of the District of Columbia, President, Struthers Research and Development Corporation.

Carl A. Auerbach of Minnesota, Professor of International Law, University of Minnesota.

George H. Sullivan, M.D., of California, Director of Life Sciences for the Northrop Corporation.

The three representatives of the Federal Government are:

Charles F. Baird, Under Secretary of the Navy.

Frank C. DiLuzio, Assistant Secretary of the Interior for Water Pollution Control.

Robert M. White, Administrator, Environmental Science Services Administration, Department of Commerce.

The Commission's four Congressional advisors are:

Senator Warren Magnuson of Washington.

Senator Norris Cotton of New Hampshire.

Representative Alton Lennon of North Carolina.

Representative Charles Mosher of Ohio.

(Whereupon, at 11:27 a.m., the subcommittee went into executive session.)

APPENDIXES

APPENDIX 1

MULTILATERAL LAW OF THE SEA: CONVENTION ON THE CONTINENTAL SHELF

Done at Geneva April 29, 1958;

Ratification advised by the Senate of the United States of America May 26, 1960;

Ratified by the President of the United States of America March 24, 1961;

Ratification of the United States of America deposited with Secretary-General of the United Nations April 12, 1961;

Proclaimed by the President of the United States of America May 25, 1964;
Entered into force June 10, 1964.

A PROCLAMATION BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

Whereas the Convention on the Continental Shelf, adopted by the United Nations Conference on the Law of the Sea, Geneva, February 24 to April 27, 1958, was open for signature from April 29 to October 31, 1958, and during that period was signed in behalf of the United States of America and forty-five other States;

Whereas a certified copy of the text of the Convention, in the English, French, Chinese, Russian, and Spanish languages, is word for word as follows:

ANNEX IV:¹ CONVENTION ON THE CONTINENTAL SHELF

The States Parties to this Convention have agreed as follows:

Article 1

For the purpose of these articles, the term "continental shelf" is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas; (b) to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands.

Article 2

1. The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources.

2. The rights referred to in paragraph 1 of this article are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities, or make a claim to the continental shelf, without the express consent of the coastal State.

3. The rights of the coastal State over the continental shelf do not depend on occupation, effective or notional, or on any express proclamation.

4. The natural resources referred to in these articles consist of the mineral and other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.

¹ The text of the convention printed herein constituted Annex IV to the Final Act of the United Nations Conference on the Law of the Sea, which was certified by the Legal Counsel, for the Secretary-General of the United Nations. [Footnote added by the Department of State.]

Article 3

The rights of the coastal State over the continental shelf do not affect the legal status of the superjacent waters as high seas, or that of the airspace above those waters.

Article 4

Subject to its right to take reasonable measures for the exploration of the continental shelf and the exploitation of its natural resources, the coastal State may not impede the laying or maintenance of submarine cables or pipe lines on the continental shelf.

Article 5

1. The exploration of the continental shelf and the exploitation of its natural resources must not result in any unjustifiable interference with navigation, fishing or the conservation of the living resources of the sea, nor result in any interference with fundamental oceanographic or other scientific research carried out with the intention of open publication.

2. Subject to the provisions of paragraphs 1 and 6 of this article, the coastal State is entitled to construct and maintain or operate on the continental shelf installations and other devices necessary for its exploration and the exploitation of its natural resources, and to establish safety zones around such installations and devices and to take in those zones measures necessary for their protection.

3. The safety zones referred to in paragraph 2 of this article may extend to a distance of 500 metres around the installations and other devices which have been erected, measured from each point of their outer edge. Ships of all nationalities must respect these safety zone.

4. Such installations and devices, though under the jurisdiction of the coastal State, do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea of the coastal State.

5. Due notice must be given of the construction of any such installations, and permanent means for giving warning of their presence must be maintained. Any installations which are abandoned or disused must be entirely removed.

6. Neither the installations or devices, nor the safety zones around them, may be established where interference may be caused to the use of recognized sea lanes essential to international navigation.

7. The coastal State is obliged to undertake, in the safety zones, all appropriate measures for the protection of the living resources of the sea from harmful agents.

8. The consent of the coastal State shall be obtained in respect of any research concerning the continental shelf and undertaken there. Nevertheless the coastal State shall not normally withhold its consent if the request is submitted by a qualified institution with a view to purely scientific research into the physical or biological characteristics of the continental shelf, subject to the proviso that the coastal State shall have the right, if it so desires, to participate or to be represented in the research, and that in any event the results shall be published.

Article 6

1. Where the same continental shelf is adjacent to the territories of two or more States whose coasts are opposite each other, the boundary of the continental shelf appertaining to such States shall be determined by agreement between them. In the absence of agreement, and unless another boundary line is justified by special circumstances, the boundary is the median line, every point of which is equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

2. Where the same continental shelf is adjacent to the territories of two adjacent States, the boundary of the continental shelf shall be determined by agreement between them. In the absence of agreement, and unless another boundary line is justified by special circumstances, the boundary shall be determined by application of the principle of equidistance from the nearest points of the baselines from which the breadth of the territorial sea of each State is measured.

3. In delimiting the boundaries of the continental shelf, any lines which are drawn in accordance with the principles set out in paragraphs 1 and 2 of this

article should be defined with reference to charts and geographical features as they exist at a particular date, and reference should be made to fixed permanent identifiable points on the land.

Article 7

The provisions of these articles shall not prejudice the right of the coastal State to exploit the subsoil by means of tunnelling irrespective of the depth of water above the subsoil.

Article 8

This Convention shall, until 31 October 1958, be open for signature by all States Members of the United Nations or of any of the specialized agencies, and by any other State invited by the General Assembly of the United Nations to become a Party to the Convention.

Article 9

This Convention is subject to ratification. The instruments of ratification shall be deposited with the Secretary-General of the United States.

Article 10

This Convention shall be open for accession by any States belonging to any of the categories mentioned in article 8. The instruments of accession shall be deposited with the Secretary-General of the United Nations.

Article 11

1. This Convention shall come into force on the thirtieth day following the date of deposit of the twenty-second instrument of ratification or accession with the Secretary-General of the United Nations.

2. For each State ratifying or acceding to the Convention after the deposit of the twenty-second instrument of ratification or accession, the Convention shall enter into force on the thirtieth day after deposit by such State of its instrument of ratification or accession.

Article 12

1. At the time of signature, ratification or accession, any State may make reservations to articles of the Convention other than to articles 1 to 3 inclusive.

2. Any Contracting State making a reservation in accordance with the preceding paragraph may at any time withdraw the reservation by a communication to that effect addressed to the Secretary-General of the United Nations.

Article 13

1. After the expiration of a period of five years from the date on which this Convention shall enter into force, at request for the revision of this Convention may be made at any time by any Contracting Party by means of a notification in writing addressed to the Secretary-General of the United Nations.

2. The General Assembly of the United Nations shall decide upon the steps, if any, to be taken in respect of such request.

Article 14

The Secretary-General of the United Nations shall inform all States Members of the United Nations and the other States referred to in article 8:

(a) Of signatures to this Convention and of the deposit of instruments of ratification or accession, in accordance with articles 8, 9 and 10;

(b) Of the date on which this Convention will come into force, in accordance with article 11;

(c) Of requests for revision in accordance with article 13;

(d) Of reservations to this Convention, in accordance with article 12.

Article 15

The original of this Convention, of which the Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations, who shall send certified copies thereof to all States referred to in article 8.

IN WITNESS WHEREOF the undersigned Plenipotentiaries, being duly authorized thereto by their respective Governments, have signed this Convention.

DONE at Geneva, this twenty-ninth day of April one thousand nine hundred and fifty-eight.

For Afghanistan: A. R. PAZHWAQ, Oct. 30, 1958	For Haiti: RIGAL
For Albania:	For the Holy See:
For Argentina: A. LESCURE	For Honduras:
For Australia: E. RONALD WALKER, 30th October 1958	For Hungary:
For Austria:	For Iceland: H. G. ANDERSEN
For the Kingdom of Belgium:	For India:
For Bolivia: M. TAMAYO, 17th October, 1958	For Indonesia: AHMAD SOEBARDJO, 8th May 1958
For Brazil:	For Iran: Subject to reservations ¹ Dr. A. MATINE-DAFTARY, May 28, 1958
For Bulgaria:	For Iraq:
For the Union of Burma:	For Ireland: FRANK AIKEN, 2-10-1958
For the Byelorussian Soviet Socialist Republic: K. KISELEV, 31.X.1958	For Israel: SHABTAI ROSENNE
For Cambodia:	For Italy:
For Canada: GEORGE A. DREW	For Japan:
For Ceylon: C. COREA 30/X/58	For the Hashemite Kingdom of Jordan:
For Chile: JOSÉ SERRANO, October 31st. 1958	For the Republic of Korea:
For China: LIU CHIEH, YU-CHI HSUEH	For Laos:
For Colombia: JUAN URIBE HOLGUÍN, JOSÉ JOAQUÍN CAICEDO CASTILLA	For Lebanon: N. SADAKA, 29 mai 1958
For Costa Rica: RAÚL TREJOS FLORES	For Liberia: ROCHEFORTE L. WEEKS, 27/5/58
For Cuba: F. V. GARCÍA AMADOR	For Libya:
For Czechoslovakia: KAREL KURKA, 31 October 1958	For the Grand Duchy of Luxembourg:
For Denmark: MAX SORESENSEN, T. OLDENBURG	For Mexico:
For the Dominican Republic:	For Monaco:
A. ALVAREZ AYBAR	For Morocco:
For Ecuador: JOSÉ A. CORREA, Oct. 31/1958	For Nepal: RISHIKESH SHAHA
For El Salvador:	For the Kingdom of the Netherlands: C. SCHURMANN, 31 October 1958
For Ethiopia:	For New Zealand: FOSS SHANAHAN, 29 October 1958
For the Federation of Malaya:	For Nicaragua:
For Finland: G. A. GRIPENBERG, 27 octobre 1958	For the Kingdom of Norway:
For France:	For Pakistan: ALY KHAN, 31st October 1958
For the Federal Republic of Germany: WERNER DANKWORT *, 30 October 1958	For Panama: CARLOS SUCRE C., 2.5.1958
For Ghana: RICHARD QUARSHIE, K. B. ASANTE	For Paraguay:
For Greece:	For Peru: ALBERTO ULLOA, October 31, 1958
For Guatemala: L. AYCINENA SALAZAR	For the Philippine Republic:
	For Poland: J. WINIEWICZ, Oct. 31, 58
	For Portugal: Sous réserve de ratifica- tion, VASCO VIEIRA GARIN, 28 octobre 1958

*Statement: "In signing the Convention on the Continental Shelf of 29 April 1958, the Federal Republic of Germany declares with reference to article 5, paragraph 1 of the Convention on the Continental Shelf that in the opinion of the Federal Government article 5, paragraph 1 guarantees the exercise of fishing rights (*Fischerei*) in the waters above the continental shelf in the manner hitherto generally in practice."

¹ "In signing this Convention on the Continental Shelf, I am instructed by the Iranian Government to make the following reservations:

"(a) Article 4: with respect to the phrase 'the coastal State may not impede the laying or maintenance of submarine cables or pipe-lines on the continental shelf', the Iranian Government reserves its rights to allow or not to allow the laying or maintenance of submarine cables or pipe-lines on its continental shelf.

"(b) Article 6: with respect to the phrase 'and unless another boundary line is justified by special circumstances' included in paragraphs 1 and 2 of this article, the Iranian Government accepts this phrase on the understanding that one method of determining the boundary line in special circumstances would be that of measurement from the high water mark.

For Romania:
 For San Marino:
 For Saudi Arabia:
 For Spain:
 For the Sudan:
 For Sweden:
 For Switzerland: F. SCHNYDER, 22
 octobre 1958
 For Thailand: LUANG CHAKRAPANI SRI-
 SILVISUDDHI, Commodore JIT SANGK-
 HADUL
 For Tunisia: MONGI SLIM, Le 30 octobre
 1958
 For Turkey:
 For the Ukrainian Soviet Socialist Re-
 public: L. PALAMARCHUK, 31 October
 1958

For the Union of South Africa:
 For the Union of Soviet Socialist Re-
 publics: V. ZORIN, 31 October 1958
 For the United Arab Republic:
 For the United Kingdom of Great Brit-
 ain and Northern Ireland: PIERSON
 DIXON, 9 Sept. 1958
 For the United States of America:
 ARTHUR H. DEAN, 15 Sept. 1958
 For Uruguay: CARLOS CARBAJAL
 For Venezuela: *
Ad referendum, CARLOS SOSA RODRÍGUEZ,
 October 30, 1958
 For Viet-Nam:
 For Yemen:
 For Yugoslavia: Avec la réserve de rati-
 fication, MILAN BARTOS, V. POPOVIC

WHEREAS the Senate of the United States of America by their resolution of May 26, 1960, two-thirds of the Senators present concurring therein, did advise and consent to the ratification of the said Convention;

WHEREAS the said Convention was duly ratified by the President of the United States of America on March 24, 1961, in pursuance of the said advice and consent of the Senate;

WHEREAS it is provided in Article 11 of the said Convention that the Convention shall come into force on the thirtieth day following the date of deposit of the twenty-second instrument of ratification or accession with the Secretary General of the United Nations:

WHEREAS instruments of ratification were deposited with the Secretary General of the United Nations by the following Governments on the dates indicated: Haiti on March 29, 1960, the Union of Soviet Socialist Republics on November 22, 1960, the Ukrainian Soviet Socialist Republic on January 12, 1961, the Byelorussian Soviet Socialist Republic on February 27, 1961, the United States of America on April 12, 1961, Venezuela, with a reservation, on August 15, 1961, Czechoslovakia on August 31, 1961, Israel on September 6, 1961, Guatemala on November 27, 1961, Colombia on January 8, 1962, Poland on June 29, 1962, Portugal on January 8, 1963, Australia on May 14 1963, Denmark on June 12, 1963, and the United Kingdom of Great Britain and Northern Ireland on May 11, 1964; instruments of accession were deposited with the Secretary General of the United Nations by the following Governments on the dates indicated: Cambodia on March 18, 1960, the Federation of Malaya on December 21, 1960, Senegal on April 25, 1961, Rumania on December 12, 1961, the Malagasy Republic on July 31, 1962, Bulgaria on August 31, 1962, and the Republic of South Africa on April 9, 1963;

AND WHEREAS, pursuant to the aforesaid provision of Article 11 of the said Convention, the Convention enters into force on June 10, 1964;

NOW, THEREFORE, be it known that I, Lyndon B. Johnson, President of the United States of America, do hereby proclaim and make public the said Convention to the end that the same and every article and clause thereof shall be observed and fulfilled with good faith, on and after June 10, 1964, by the United States of America and by the citizens of the United States of America and all other persons subject to the jurisdiction thereof.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the city of Washington this twenty-fifth day of May in the year of [SEAL] our Lord one thousand nine hundred sixty-four and of the Independence of the United States of America the one hundred eighty-eighth.

LYNDON B. JOHNSON.

By the President:

DEAN RUSK,

Secretary of State.

*Translation [from Spanish to English] by the Secretariat: In signing the present Convention, the Republic of Venezuela declares with reference to article 6 that there are special circumstances to be taken into consideration in the following areas: the Gulf of Paria, in so far as the boundary is not determined by existing agreements, and in zones adjacent thereto; the area between the coast of Venezuela and the island of Aruba; and the Gulf of Venezuela.

APPENDIX 2

UNITED NATIONS GENERAL ASSEMBLY, TWENTY-FIRST SESSION

RESOLUTION ADOPTED BY THE GENERAL ASSEMBLY [ON THE REPORT OF THE SECOND COMMITTEE (A/6533)]

2172 (XXI). *Resources of the sea*

The General Assembly.

Recognizing the need for a greater knowledge of the oceans and of the opportunities available for the utilization of their resources, living and mineral,

Realizing that the effective exploitation and development of these resources can raise the economic level of peoples throughout the world, and in particular of the developing countries,

Taking into account with appreciation the activities in the field of resources of the sea at present being undertaken by the United Nations, the United Nations Educational, Scientific and Cultural Organization and, in particular, its Intergovernmental Oceanographic Commission, the Food and Agriculture Organization of the United Nations and, in particular, its Committee on Fisheries, the World Meteorological Organization, the Advisory Committee on the Application of Science and Technology to Development, other intergovernmental organizations concerned, various Governments, universities, scientific and technological institutions and other interested organizations,

Considering the need to maximize international co-operative efforts for the further development of marine science and technology and to avoid duplication or overlapping of efforts in this field,

1. *Endorses* Economic and Social Council resolution 1112 (XL) of 7 March 1966 requesting the Secretary-General to make a survey of the present state of knowledge of the resources of the sea beyond the continental shelf, excluding fish, and of the techniques for exploiting these resources;

2. *Requests* the Secretary-General—in co-operation with the United Nations Educational, Scientific and Cultural Organization and, in particular, its Intergovernmental Oceanographic Commission, the Food and Agriculture Organization of the United Nations and, in particular, its Committee on Fisheries, the World Meteorological Organization, other intergovernmental organizations concerned, and the Governments of interested Member States, and utilizing, *inter alia*, such voluntary services as may be offered—to undertake, in addition to the survey requested by the Economic and Social Council, a comprehensive survey of activities in marine science and technology, including that relating to mineral resources development, undertaken by members of the United Nations family of organizations, various Member States and intergovernmental organizations concerned, as well as by universities, scientific and technological institutes and other interested organization;

3. *Requests* the Secretary-General, in co-operation with the United Nations Educational, Scientific and Cultural Organization and, in particular, its Intergovernmental Oceanographic Commission and the Food and Agriculture Organization of the United Nations and, in particular, its Committee on Fisheries, and in the light of the above-mentioned comprehensive survey to formulate proposals for:

(a) Ensuring the most effective arrangements for an expanded programme of international co-operation to assist in a better understanding of the marine environment through science and in the exploitation and development of marine resources, with due regard to the conservation of fish stocks;

(b) Initiating and strengthening marine education and training programmes, bearing in mind the close interrelationship between marine and other sciences;

4. *Requests* the Secretary-General to set up a small group of experts to be selected, as far as possible, from the specialized agencies and intergovernmental organizations concerned, to assist him in the preparation of the comprehensive survey called for in paragraph 2 above and in the formulation of the proposals referred to in paragraph 3 above;

5. *Requests* that the survey and proposals prepared by the Secretary-General be submitted to the Advisory Committee on the Application of Science and Technology to Development for its comments;

6. *Requests* the Secretary-General to submit his survey and proposals, together with the comments of the Advisory Committee, to the General Assembly at its twenty-third session, through the Economic and Social Council.

1485th plenary meeting, 6 December 1966.

APPENDIX 3

MARINE RESOURCES AND ENGINEERING DEVELOPMENT ACT OF 1966

[S. 944 ; Public Law 89-454 ; 80 Stat. 203]

AN ACT To provide for a comprehensive, long-range, and coordinated national program in marine science, to establish a National Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering and Resources, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That:

This Act may be cited as the "Marine Resources and Engineering Development Act of 1966."

DECLARATION OF POLICY AND OBJECTIVES

SEC. 2. (a) It is hereby declared to be the policy of the United States to develop, encourage, and maintain a coordinated, comprehensive, and long-range national program in marine science for the benefit of mankind to assist in protection of health and property, enhancement of commerce, transportation, and national security, rehabilitation of our commercial fisheries, and increased utilization of these and other resources.

(b) The marine science activities of the United States should be conducted so as to contribute to the following objectives:

(1) The accelerated development of the resources of the marine environment.

(2) The expansion of human knowledge of the marine environment.

(3) The encouragement of private investment enterprise in exploration, technological development, marine commerce, and economic utilization of the resources of the marine environment.

(4) The preservation of the role of the United States as a leader in marine science and resource development.

(5) The advancement of education and training in marine science.

(6) The development and improvement of the capabilities, performance, use, and efficiency of vehicles, equipment, and instruments for use in exploration, research, surveys, the recovery of resources, and the transmission of energy in the marine environment.

(7) The effective utilization of the scientific and engineering resources of the Nation, with close cooperation among all interested agencies, public and private, in order to avoid unnecessary duplication of effort, facilities, and equipment, or waste.

(8) The cooperation by the United States with other nations and groups of nations and international organizations in marine science activities when such cooperation is in the national interest.

THE NATIONAL COUNCIL ON MARINE RESOURCES AND ENGINEERING DEVELOPMENT

SEC. 3. (a) There is hereby established, in the Executive Office of the President, the National Council on Marine Resources and Engineering Development (hereinafter called the "Council") which shall be composed of—

(1) The Vice President, who shall be Chairman of the Council.

(2) The Secretary of State.

(3) The Secretary of the Navy.

(4) The Secretary of the Interior.

(5) The Secretary of Commerce.

(6) The Chairman of the Atomic Energy Commission.

(7) The Director of the National Science Foundation.

(8) The Secretary of Health, Education, and Welfare.

(9) The Secretary of the Treasury.

(b) The President may name to the Council such other officers and officials as he deems advisable.

(c) The President shall from time to time designate one of the members of the Council to preside over meetings of the Council during the absence, disability, or unavailability of the Chairman.

(d) Each member of the Council, except those designated pursuant to subsection (b), may designate any officer of his department or agency appointed with the advice and consent of the Senate to serve on the Council as his alternate in his unavoidable absence.

(e) The Council may employ a staff to be headed by a civilian executive secretary who shall be appointed by the President and shall receive compensation at a rate established by the President at not to exceed that of level II of the Federal Executive Salary Schedule. The executive secretary, subject to the direction of the Council, is authorized to appoint and fix the compensation of such personnel, including not more than seven persons who may be appointed without regard to civil service laws or the Classification Act of 1949 and compensated at not to exceed the highest rate of grade 18 of the General Schedule of the Classification Act of 1949, as amended, as may be necessary to perform such duties as may be prescribed by the President.

(f) The provisions of this Act with respect to the Council shall expire one hundred and twenty days after the submission of the final report of the Commission pursuant to section 5(h).

RESPONSIBILITIES

SEC. 4. (a) In conformity with the provisions of section 2 of this Act, it shall be the duty of the President with the advice and assistance of the Council to—

(1) survey all significant marine science activities, including the policies, plans, programs, and accomplishments of all departments and agencies of the United States engaged in such activities;

(2) develop a comprehensive program of marine science activities, including, but not limited to, exploration, description and prediction of the marine environment, exploitation and conservation of the resources of the marine environment, marine engineering, studies of air-sea interaction, transmission of energy, and communications, to be conducted by departments and agencies of the United States, independently or in cooperation with such non-Federal organizations as States, institutions and industry;

(3) designate and fix responsibility for the conduct of the foregoing marine science activities by departments and agencies of the United States;

(4) insure cooperation and resolve differences arising among departments and agencies of the United States with respect to marine science activities under this Act, including differences as to whether a particular project is a marine science activity;

(5) undertake a comprehensive study, by contract or otherwise, of the legal problems arising out of the management, use, development, recovery, and control of the resources of the marine environment;

(6) establish long-range studies of the potential benefits to the United States economy, security, health, and welfare to be gained from marine resources, engineering, and science, and the costs involved in obtaining such benefits; and

(7) review annually all marine science activities conducted by departments and agencies of the United States in light of the policies, plans, programs, and priorities developed pursuant to this Act.

(b) In the planning and conduct of a coordinated Federal program the President and the Council shall utilize such staff, interagency, and non-Government advisory arrangements as they may find necessary and appropriate and shall consult with departments and agencies concerned with marine science activities and solicit the views of non-Federal organizations and individuals with capabilities in marine sciences.

COMMISSION ON MARINE SCIENCE, ENGINEERING, AND RESOURCES

SEC. 5. (a) The President shall establish a Commission on Marine Science, Engineering, and Resources (in this Act referred to as the "Commission"). The Commission shall be composed of fifteen members appointed by the President,

including individuals drawn from Federal and State governments, industry, universities, laboratories and other institutions engaged in marine scientific or technological pursuits, but not more than five members shall be from the Federal Government. In addition the Commission shall have four advisory members appointed by the President from among the Members of the Senate and the House of Representatives. Such advisory members shall not participate, except in an advisory capacity, in the formulation of the findings and recommendations of the Commission. The President shall select a Chairman and Vice Chairman from among such fifteen members. The Vice Chairman shall act as Chairman in the latter's absence.

(b) The Commission shall make a comprehensive investigation and study of all aspects of marine science in order to recommend an overall plan for an adequate national oceanographic program that will meet the present and future national needs. The Commission shall undertake a review of existing and planned marine science activities of the United States in order to assess their adequacy in meeting the objectives set forth under section 2(b), including but not limited to the following:

(1) Review the known and contemplated needs for natural resources from the marine environment to maintain our expanding national economy.

(2) Review the surveys, applied research programs, and ocean engineering projects required to obtain the needed resources from the marine environment.

(3) Review the existing national research programs to insure realistic and adequate support for basic oceanographic research that will enhance human welfare and scientific knowledge.

(4) Review the existing oceanographic and ocean engineering programs, including education and technical training, to determine which programs are required to advance our national oceanographic competence and stature and which are not adequately supported.

(5) Analyze the findings of the above reviews, including the economic factors involved, and recommend an adequate national marine science program that will meet the present and future national needs without unnecessary duplication of effort.

(6) Recommend a Governmental organizational plan with estimated cost.

(c) Members of the Commission appointed from outside the Government shall each receive \$100 per diem when engaged in the actual performance of duties of the Commission and reimbursement of travel expenses, including per diem in lieu of subsistence, as authorized in section 5 of the Administrative Expenses Act of 1946, as amended (5 U.S.C. 73b-2), for persons employed intermittently. Members of the Commission appointed from within the Government shall serve without additional compensation to that received for their services to the Government but shall be reimbursed for travel expenses, including per diem in lieu of subsistence, as authorized in the Act of June 9, 1949, as amended (5 U.S.C. 835-842).

(d) The Commission shall appoint and fix the compensation of such personnel as it deems advisable in accordance with the civil service laws and the Classification Act of 1949, as amended. In addition, the Commission may secure temporary and intermittent services to the same extent as is authorized for the departments by section 15 of the Administrative Expenses Act of 1946 (60 Stat. 810), but at rates not to exceed \$100 per diem for individuals.

(e) The Chairman of the Commission shall be responsible for (1) the assignment of duties and responsibilities among such personnel and their continuing supervision, and (2) the use of expenditures of funds available to the Commission. In carrying out the provisions of this subsection, the Chairman shall be governed by the general policies of the Commission with respect to the work to be accomplished by it and the timing thereof.

(f) Financial and administrative services (including those related to budgeting, accounting, financial reporting, personnel, and procurement) may be provided the Commission by the General Services Administration, for which payment shall be made in advance, or by reimbursement from funds of the Commission in such amounts as may be agreed upon by the Chairman of the Commission and the Administrator of General Services: *Provided*, That the regulations of the General Services Administration for the collection of indebtedness of personnel resulting from erroneous payments (5 U.S.C. 46d) shall apply to the col-

lection of erroneous payments made to or on behalf of a Commission employee, and regulations of said Administrator for the administrative control of funds (31 U.S.C. 665(g)) shall apply to appropriations of the Commission: *And provided further*, That the Commission shall not be required to prescribe such regulations.

(g) The Commission is authorized to secure directly from any executive department, agency, or independent instrumentality of the Government any information it deems necessary to carry out its functions under this Act; and each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information to the Commission, upon request made by the Chairman.

(h) The Commission shall submit to the President, via the Council, and to the Congress not later than eighteen months after the establishment of the Commission as provided in subsection (a) of this section, a final report of its findings and recommendations. The Commission shall cease to exist thirty days after it has submitted its final report.

INTERNATIONAL COOPERATION

SEC. 6. The Council, under the foreign policy guidance of the President and as he may request, shall coordinate a program of international cooperation in work done pursuant to this Act, pursuant to agreements made by the President with the advice and consent of the Senate.

REPORTS

SEC. 7. (a) The President shall transmit to the Congress in January of each year a report, which shall include (1) a comprehensive description of the activities and the accomplishments of all agencies and departments of the United States in the field of marine science during the preceding fiscal year, and (2) an evaluation of such activities and accomplishments in terms of the objectives set forth pursuant to this Act:

(b) Reports made under this section shall contain such recommendations for legislation as the President may consider necessary or desirable for the attainment of the objectives of this Act, and shall contain an estimate of funding requirements of each agency and department of the United States for marine science activities during the succeeding fiscal year.

DEFINITIONS

SEC. 8. For the purposes of this Act the term "marine science" shall be deemed to apply to oceanographic and scientific endeavors and disciplines, and engineering and technology in and with relation to the marine environment; and the term "marine environment" shall be deemed to include (a) the oceans, (b) the Continental Shelf of the United States, (c) the Great Lakes, (d) seabed and subsoil of the submarine areas adjacent to the coasts of the United States to the depth of two hundred meters, or beyond that limit, to where the depths of the superjacent waters admit of the exploitation of the natural resources of such areas, (e) the seabed and subsoil of similar submarine areas adjacent to the coasts of islands which comprise United States territory, and (f) the resources thereof.

AUTHORIZATION

SEC. 9. There are hereby authorized to be appropriated such sums as may be necessary to carry out this Act, but sums appropriated for any one fiscal year shall not exceed \$1,500,000.

Approved June 17, 1966.

APPENDIX 4

NATIONAL SEA GRANT COLLEGE AND PROGRAM ACT OF 1966

[Public Law 89-688, 89th Congress, H.R. 16559, Oct. 15, 1966]

AN ACT To amend the Marine Resources and Engineering Development Act of 1966 to authorize the establishment and operation of sea grant colleges and programs by initiating and supporting programs of education and research in the various fields relating to the development of marine resources, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Marine Resources and Engineering Development Act of 1966 is amended by adding at the end thereof the following new title:

"TITLE II—SEA GRANT COLLEGES AND PROGRAMS

"SHORT TITLE

"SEC. 201. This title may be cited as the 'National Sea Grant College and Program Act of 1966'.

"DECLARATION OF PURPOSE

"SEC. 202. The Congress hereby finds and declares—

"(a) that marine resources, including animal and vegetable life and mineral wealth, constitute a far-reaching and largely untapped asset of immense potential significance to the United States; and

"(b) that it is in the national interest of the United States to develop the skilled manpower, including scientists, engineers, and technicians, and the facilities and equipment necessary for the exploitation of these resources; and

"(c) that aquaculture, as with agriculture on land, and the gainful use of marine resources can substantially benefit the United States, and ultimately the people of the world, by providing greater economic opportunities, including expanded employment and commerce; the enjoyment and use of our marine resources; new sources of food; and new means for the development of marine resources; and

"(d) that Federal support toward the establishment, development, and operation of programs by sea grant colleges and Federal support of other sea grant programs designed to achieve the gainful use of marine resources, offer the best means of promoting programs toward the goals set forth in clauses (a), (b), and (c), and should be undertaken by the Federal Government; and

"(e) that in view of the importance of achieving the earliest possible institution of significant national activities related to the development of marine resources, it is the purpose of this title to provide for the establishment of a program of sea grant colleges and education, training, and research in the fields of marine science, engineering, and related disciplines.

"GRANTS AND CONTRACTS FOR SEA GRANT COLLEGES AND PROGRAMS

"SEC. 203. (a) The provisions of this title shall be administered by the National Science Foundation (hereafter in this title referred to as the 'Foundation').

"(b) (1) For the purpose of carrying out this title, there is authorized to be appropriated to the Foundation for the fiscal year ending June 30, 1967, not to exceed the sum of \$5,000,000, for the fiscal year ending June 30, 1968, not to exceed the sum of \$15,000,000, and for each subsequent fiscal year only such sums as the Congress may hereafter specifically authorize by law.

"(2) Amounts appropriated under this title are authorized to remain available until expended.

"MARINE RESOURCES

"SEC. 204. (a) In carrying out the provisions of this title the Foundation shall (1) consult with those experts engaged in pursuits in the various fields related to the development of marine resources and with all departments and agencies of the Federal Government (including the United States Office of Education in all matters relating to education) interested in, or affected by, activities in any such fields, and (2) seek advice and counsel from the National Council on Marine Resources and Engineering Development as provided by section 205 of this title.

"(b) The Foundation shall exercise its authority under this title by—

"(1) initiating and supporting programs at sea grant colleges and other suitable institutes, laboratories, and public or private agencies for the education of participants in the various fields relating to the development of marine resources;

"(2) initiating and supporting necessary research programs in the various fields relating to the development of marine resources, with preference given to research aimed at practices, techniques, and design of equipment applicable to the development of marine resources; and

"(3) encouraging and developing programs consisting of instruction, practical demonstrations, publications, and otherwise, by sea grant colleges and other suitable institutes, laboratories, and public or private agencies through marine advisory programs with the object of imparting useful information to persons currently employed or interested in the various fields related to the development of marine resources, the scientific community, and the general public.

"(c) Programs to carry out the purposes of this title shall be accomplished through contracts with, or grants to, suitable public or private institutions of higher education, institutes, laboratories, and public or private agencies which are engaged in, or concerned with, activities in the various fields related to the development of marine resources, for the establishment and operation by them of such programs.

"(d) (1) The total amount of payments in any fiscal year under any grant to or contract with any participant in any program to be carried out by such participant under this title shall not exceed 66 $\frac{2}{3}$ per centum of the total cost of such program. For purposes of computing the amount of the total cost of any such program furnished by any participant in any fiscal year, the Foundation shall include in such computation an amount equal to the reasonable value of any buildings, facilities, equipment, supplies, or services provided by such participant with respect to such program (but not the cost or value of land or of Federal contributions).

"(2) No portion of any payment by the Foundation to any participant in any program to be carried out under this title shall be applied to the purchase or rental of any land or the rental, purchase, construction, preservation, or repair of any building, dock, or vessel.

"(3) The total amount of payments in any fiscal year by the Foundation to participants within any State shall not exceed 15 per centum of the total amount appropriated to the Foundation for the purposes of this title for such fiscal year.

"(e) In allocating funds appropriated in any fiscal year for the purposes of this title the Foundation shall endeavor to achieve maximum participation by sea grant colleges and other suitable institutes, laboratories, and public or private agencies throughout the United States, consistent with the purposes of this title.

"(f) In carrying out its functions under this title, the Foundation shall attempt to support programs in such a manner as to supplement and not duplicate or overlap any existing and related Government activities.

"(g) Except as otherwise provided in this title, the Foundation shall, in carrying out its functions under this title, have the same powers and authority it has under the National Science Foundation Act of 1950 to carry out its functions under that Act.

"(h) The head of each department, agency, or instrumentality of the Federal Government is authorized, upon request of the Foundation, to make available to the Foundation, from time to time, on a reimbursable basis, such personnel, services, and facilities as may be necessary to assist the Foundation in carrying out its functions under this title.

"(i) For the purposes of this title—

"(1) the term 'development of marine resources' means scientific endeavors relating to the marine environment, including, but not limited to, the fields oriented toward the development, conservation, or economic utilization of the physical, chemical, geological, and biological resources of the marine environment; the fields of marine commerce and marine engineering; the fields relating to exploration or research in, the recovery of natural resources from, and the transmission of energy in, the marine environment; the fields of oceanography and oceanology; and the fields with respect to the study of the economic, legal, medical, or sociological problems arising out of the management, use, development, recovery, and control of the natural resources of the marine environment;

"(2) the term 'marine environment' means the oceans; the Continental Shelf of the United States; the Great Lakes; the seabed and subsoil of the submarine areas adjacent to the coasts of the United States to the depth of two hundred meters, or beyond that limit, to where the depths of the superjacent waters admit of the exploitation of the natural resources of the area; the seabed and subsoil of similar submarine areas adjacent to the coasts of islands which comprise United States territory; and the natural resources thereof;

"(3) the term 'sea grant college' means any suitable public or private institution of higher education supported pursuant to the purposes of this title which has major programs devoted to increasing our Nation's utilization of the world's marine resources; and

"(4) the term 'sea grant program' means (A) any activities of education or research related to the development of marine resources supported by the Foundation by contracts with or grants to institutions of higher education either initiating, or developing existing, programs in fields related to the purposes of this title, (B) any activities of education or research related to the development of marine resources supported by the Foundation by contracts with or grants to suitable institutes, laboratories, and public or private agencies, and (C) any programs of advisory services oriented toward imparting information in fields related to the development of marine resources supported by the Foundation by contracts with or grants to suitable institutes, laboratories, and public or private agencies.

"ADVISORY FUNCTIONS

"SEC. 205. The National Council on Marine Resources and Engineering Development established by section 3 of title I of this Act shall, as the President may request—

"(1) advise the Foundation with respect to the policies, procedures, and operations of the Foundation in carrying out its functions under this title;

"(2) provide policy guidance to the Foundation with respect to contracts or grants in support of programs conducted pursuant to this title, and make such recommendations thereon to the Foundation as may be appropriate; and

"(3) submit an annual report on its activities and its recommendations under this section to the Speaker of the House of Representatives, the Committee on Merchant Marine and Fisheries of the House of Representatives, the President of the Senate, and the Committee on Labor and Public Welfare of the Senate."

SEC. 2. (a) The Marine Resources and Engineering Development Act of 1966 is amended by striking out the first section and inserting in lieu thereof the following:

"TITLE I—MARINE RESOURCES AND ENGINEERING DEVELOPMENT

"SHORT TITLE

"SECTION 1. This title may be cited as the 'Marine Resources and Engineering Development Act of 1966'."

(b) Such Act is further amended by striking out "this Act" the first place it appears in section 4(a), and also each place it appears in sections 5(a), 8, and 9, and inserting in lieu thereof in each such place "this title".

Approved October 15, 1966.

APPENDIX 5

ADDRESS BY UNDER SECRETARY CHARLES F. LUCE, DEPARTMENT OF THE INTERIOR, AT AMERICAN BAR ASSOCIATION NATIONAL INSTITUTE ON MARINE RESOURCES, LONG BEACH, CALIF., JUNE 8, 1967

THE DEVELOPMENT OF OCEAN MINERALS AND THE LAW OF THE SEA

If oceanographers were to adopt a patron saint, Homer's Odysseus would be a likely candidate. To calm the wrath of Poseidon, god of the sea, it was Odysseus' task to walk with an oar on his shoulder until he found men who thought it was a winnowing shovel—men who knew not of the sea and did not mix salt with their food. He was then to fix the oar in the ground and sacrifice to Poseidon. The task of oceanographers since has been much the same—to spread knowledge and reverence of the sea.

The knowledge they spread is hopeful. They tell us the seas are a vast reservoir of foodstuff and minerals; that much can be exploited now and that much more is within the range of a fast advancing technology.

Minerals production at deep water now appears feasible. Oil is currently produced in water as deep as 285 feet, and the capability to produce at greater depths exists. A platform recently completed in the Netherlands will be able to drill to 15,000 feet while resting on bottom in 135 feet of water, or while afloat in 600 feet. For those who like to think big, it should be noted that this platform is 350 feet long and 357 feet wide, and stands 166 feet from the underside of the keel to the main deck. It is slightly smaller than the Department of the Interior Building in Washington, D.C.

The capacity to extract other minerals from the ocean floor is also growing. Freeport Sulphur Company recovers sulphur at the Grand Isle area, seven miles off the coast of Louisiana, in 50 feet of water from a Y-shaped structure with a total length of about one mile.

The mining of substantial quantities of offshore alluvials is likewise accelerating. In 1966 there were throughout the world 66 known offshore mining operations for unconsolidated deposits with production estimated to have a value of \$164 million. A large proportion (about \$100 million) was for sand and gravel. Other operations included diamond mining off Southwest Africa, (\$8.9 million); iron sands off Japan (\$3.6 million) and tin sands off Southeast Asia (\$44.8 million). One lime shell dredge off Iceland is now working in 145 feet of water.

Let you conclude we have reached the outer limits of technological capability. I should point out that oil companies have done exploratory drilling in 4,500 feet of water. There have been serious proposals to recover phosphorite nodules from areas 40 miles off the California coast in water as deep as 1,500 feet, and to dredge manganese nodules from the Blake Plateau, 300 miles off the United States South Atlantic coast, in water as deep as 4,000 feet. The prospects for recovering manganese nodules at depths as great as 20,000 feet have received serious attention.

It is apparent that the state of the art is moving on collision course with the legal regime of offshore boundaries provided in the Convention on the Continental Shelf, i.e., that each coastal state owns its shelf to a depth of 200 meters, and beyond where the superjacent waters admit of exploitation. More and more frequently questions are raised as to the effect of that formulation on deep ocean mineral exploitation.

At the same time there is a growing concern that in the very near future a few oceanographic powers will have the capability to occupy and thereby appropriate all the deep ocean mineral areas that it will be worthwhile to develop for many generations.

President Johnson expressed this concern on July 13, 1966, at the commissioning of the "Oceanographer." He stated

... under no circumstances, we believe, must we ever allow the prospects of rich harvest and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep seas and the ocean bottoms are, and remain, the legacy of all human beings.

Our generation will therefore make the most fundamental decisions about rights in and uses of the lands beneath the sea. The pressures to make the decisions soon are mounting.

The United Nations Institute on Training and Research is pressing for clarification of the legal status governing the exploitation of mineral resources of the deep seabeds.

The United Nations Economic and Social Council adopted a resolution on March 7, 1966, requesting that the Secretary General make a survey of the present state of knowledge of resources of the sea beyond the continental shelves, and of the techniques to exploit them.

The United Nations General Assembly adopted a resolution on December 6, 1966, requesting that the Secretary General make a comprehensive survey of activities in marine science and technology, looking toward proposals for (a) ensuring the most effective arrangements for an expanded program of international cooperation and (b) strengthening marine education and training programs.

The Soviet Union proposed, at a meeting of the Intergovernmental Oceanographic Commission in Monaco in January 1967, the creation of a working group to prepare a draft convention on ways of using mineral resources of the open seas. The proposal was circulated to IOC members for comment and consideration at the next session of the IOC in Paris in October 1967.

In this country the Commission to Study the Organization of the Peace is pressing for clarification of legal and policy issues relating to exploitation of mineral resources of the seabeds. The Commission has proposed United Nations ownership and licensing for exploitation of sea floor minerals, with the income to flow to the United Nations.

The House of Delegates of the American Bar Association adopted a resolution on August 6, 1966, urging the Government to formulate legal principles relating to sea resources in consultation with representatives of the American Bar Association and others.

And on February 15, 1967, Senator Frank Church proposed that title to mineral resources on the ocean floor beyond the continental shelves be conferred on the United Nations, under an international agreement regulating their development, and also providing the United Nations with a source of revenue.

It therefore behooves us to give the most serious study now to proposals for international agreement on exploitation of ocean floor minerals—a task to which this Conference is largely devoted.

Let me suggest some of the considerations for that inquiry.

First, it must be recognized that only a few nations have substantial oceanographic capabilities, but many nations have substantial coastlines. Any proposal which would preempt the future of mineral exploitation for the few leaders is likely to be considered unfair by a majority of coastal nations, and unlikely to win their concurrence. Were it adopted without their concurrence, its standing as international law would be tenuous indeed.

Second, few nations, large or small, will view with equanimity any proposal which would have the effect of allowing emplacement of foreign controlled structures near their coasts. Many coastal nations would be required to yield rights already asserted. Some South American nations, for example, claim the seabed for 200 miles from their coast. And the United States has taken action consistent with a claim of sovereign rights to the seabed and subfloor some distance from its coasts, by the granting of a phosphate lease some 40 miles from the California coast in the Forty-Mile Bank area in 240 to 4,000 feet of water; by the granting of oil and gas leases some 30 miles off the Oregon coast in about 1,500 feet of water; and in the threatened litigation against creation of a new island by private parties on Cortez Bank, about 50 miles from San Clemente Island off the coast of California, or about 100 miles from the mainland. Each of the California areas is separated from the coast by troughs as much as 4,000 to 5,000 feet deep. The Department of the Interior has published OCS Leasing Maps indicating an intent to assume jurisdiction over the ocean bottom as far as 100 miles off the Southern California coast in water depths as great as 6,000 feet.

Additionally, the emplacement of nearby structures under foreign control could cause apprehension because of potential interference with navigation, fishing, recreation, submarine pipelines and cables, and military exercises. To illustrate how substantial the disturbance might be, let me read to you an excerpt from a description of activities off the Atlantic and Pacific coasts of the United States. As I read, imagine that a substantial number of foreign controlled drilling and mining facilities were located in the area.

... Around the entire length of the coastline, there is scarcely a square mile that is not being used for some purpose and usually for more than one purpose. The chief tenant is the Department of Defense, but not in every case. There are bombing and gunnery ranges, test and calibration ranges, carrier operating areas, submarine operating areas, torpedo firing ranges, transit lanes, and vast and complicated underwater sound surveillance systems tied to each other and to the shore by a network of cables. On the Atlantic and Pacific coasts there are also a great many more commercial shipping routes than in the Gulf, and the number of clear days is measurably less. There are commercial cables, oyster beds, and fishing shoals to be considered and a growing number of privately owned submersible craft operating in the relatively shallow waters above the shelf. . . . The Continental Shelf and the sea and air above it may give the appearance of being spacious and empty, when in fact they are not. Far from being empty, the Shelf deserves to be called our Crowded Frontier.¹

The potential use of foreign controlled structures for covert espionage and military purposes would also be unsettling to the adjacent coastal nations, particularly those with the least sea-watch capabilities of their own.

Third, coastal states are likely to be more concerned about pollution hazards from offshore facilities not under their jurisdiction than from facilities they have authority to regulate. The prospect of a break in a high pressure submerged oil pipeline where offshore winds prevail is enough to make any coastal nation uneasy, particularly in view of the Torrey Canyon disaster. And it would not be hard to understand anxiety about a possible rupture in a line such as that currently planned for the Gulf of Mexico, which for a distance of more than 30 miles, will carry 150,000 barrels of crude oil per day. Similarly, consider the likely attitude of coastal oystermen toward minerals dredging operations such as those for tin-bearing sands off the coast of Indonesia where a single dredge is capable of picking up and dumping 7.5 million tons of sediments per year. By comparison, the annual average sediment discharge of the Sacramento River is 6 million tons.

Fourth, the vesting in coastal nations of exclusive rights to all the seabottom minerals in areas far offshore could frustrate for a very long time any attempt to share the resources with less developed nations.

Fifth, the drawing of undersea boundaries on the basis of sea floor topography would result in great disparities in sea floor ownership. The 200 meter isobath, for example, would confirm a belt of submerged land ownership of 30 miles or less to many nations of the Pacific Coast of North and South America; over 200 miles to Argentina; perhaps 800 miles to Russia in the East Siberian Sea. North Sea nations recognized this problem by dividing the bottom to give Norway its share based on equidistance rather than by insisting that the Norwegian Deep cut Norway short.

In addition, there are substantial problems of drawing boundaries based on bottom relief. The Pacific coastal lands off most of North and South America, for example, have much the same irregular relief as upland coastal ranges—high mountains, deep canyons, steep ridges. The plotting of boundaries from such points on land would be a difficult enterprise. To draw international boundaries from such underwater irregularities is likely to be even more difficult and hazardous. Moreover, the delays inherent in the process might deter minerals exploitation because of uncertainty of sovereignty over the lands.

Sixth, proposals to vest an international body with ownership of ocean bottom minerals will have to address themselves to basic questions of minerals and natural resource management. Since the Department of the Interior has had very wide experience in this field, let me sketch some of the problems to be faced.

At the outset it will have to be decided whether the international regime will have authority to withhold areas from exploration and development. Under our

¹ U.S. Department of the Interior, Petroleum Production, Drilling and Leasing on the Continental Shelf, May 1966, p. 20.

domestic minerals regime this power has been found necessary. It is exercised in a variety of ways. The public lands which are open to mining occupancy may be withdrawn by Executive Order or legislation. Some are withdrawn permanently because of inconsistency of mining with other uses, e.g., National Parks, some power sites, Indian reservations. Some are withdrawn temporarily, to preserve resources in aid of legislation. Some are withdrawn from some kinds of activities, but not others, e.g., the oil shale lands are withdrawn from mining location and oil shale leasing, but not from oil and gas leasing. Each case of withdrawal expresses a Governmental judgment that a particular kind of mineral exploitation in a designated area must yield to other interests considered more important, for a time, or permanently. It is a process of balancing values and choosing among them, and it is an inescapable one for a landlord who is administering a trust for others.

The regime of seabottom land stewardship will have to make similar balances. There will be competition between mineral development, surface and undersea navigation, submarine pipelines and cables, fishing, recreation, pollution control, military exercises, and scientific inquiry.

Thus at the threshold consideration will have to be given to the amount of discretion to be vested in the new landlord of the sea, and the amount to be reserved for future agreement. Basic policy questions are involved. For example, would the landlord be authorized to close from mineral development areas used for missile ranges, or conversely, to permit development in areas currently used for missile ranges? Would the landlord have authority to permit, or to prevent, development in traditional fishing areas?

Related to the withdrawal question is the problem of allocation of the sea floor. In our law allocation is also handled in several ways. In the vast public domain open to mining location for such minerals as gold, silver, copper, lead and zinc, the resource, for a fixed acreage, is given to the one who makes the discovery, occupies the site, and extracts the mineral. The discoverer gets the minerals free of rent, royalty or other payment to the Government and also has the opportunity to purchase the fee, at nominal prices.

Certain other minerals, including oil, gas, sulphur, sodium and potassium, may be recovered only by obtaining a lease. There are several leasing methods. On the uplands, on wildcat locations, the lease goes to the first applicant, and an elaborate lottery system is used in the very frequent cases of simultaneous filing of applications. The royalty is 12½ percent of value of minerals produced. If the land contains a known geologic structure, in a producing oil and gas field, leases are obtained by cash bonus competitive bidding. There is also a royalty on production.

On the Outer Continental Shelf a competitive leasing system is used, with leases going to the high cash bonus bidder, who must also pay a royalty on production.

The so-called common variety minerals such as sand and gravel are disposed of by sale of the material only, leaving the land in federal ownership.

Any study of proposals for an international landlord of the seabottom will have to consider first whether allocations should be made to nations, for sub-allocation by them, or directly to those who will do the developing.

If the decision is to allocate directly, then consideration will have to be given the extent to which the allocation choices should be delegated to the international body, or spelled out in advance, or reserved for future agreement.

An element of this decision will be the question of acreage limitation policy. All the United States mining and leasing laws spell out the maximum acreage per claim or lease. In addition there are in some cases limitations on total acreage which one person or firm may hold. The purposes of these limitations are to prevent monopolization of the resources and speculative holdings.

Here too the initial question will be how much authority should be delegated to the international body. But whoever is given the authority will necessarily have to develop a firm base of information to avoid drawing area limits so small as to be uneconomic, or so large as to permit speculators to tie up large areas and thereby usurp the power to dispose of the resources.

These then are some, but by no means all, of the questions of resource management inherent in proposals to vest title in an international body. The solution will require the best efforts of the keenest minds that can be assembled. Representatives of the American Bar Association, possibly through cooperative efforts with representatives of the bars of other countries, could make valuable contributions to this endeavor.

APPENDIX 6

ALTERNATIVE REGIMES FOR THE MINERALS OF THE SEA FLOOR, BY FRANCIS T. CHRISTY, JR., RESOURCES FOR THE FUTURE, INC., FOR AMERICAN BAR ASSOCIATION NATIONAL INSTITUTE ON MARINE RESOURCES

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This paper discusses some of the pros and cons of alternative solutions to the problems raised by the possible exploitation of minerals on the floor of the deep sea. It begins by presenting some background information on the status of the law of the sea and on the economics of a potential sea mining operation. Certain criteria for the selection among alternative regimes are suggested. And finally, it examines some of the major elements of the possible regimes—the jurisdictions and rules—that may be adopted to govern the exploitation of deep sea minerals.

THE LAW OF THE SEA

The possible exploitation of manganese nodules raises two questions that are not answerable within the framework of existing law. There is no clear cut limit to the extent of the rights of the coastal state to the resources of the sea bottom. And there is no jurisdiction to govern the interest of the world community in the resources that lie beyond the limits of the coastal states, however those limits are defined.

The Geneva Convention on the Continental Shelf states that the limits of the exclusive rights of a coastal state extend "to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources. . . ." Thus the only limit is that which is measured by the criterion of exploitability.

This openendedness resulted from the inability of the Convention delegates to anticipate the possibilities of deep water exploitation and from the apparent inequities of a geologically determined boundary. These inequities arise because of the lack of uniformity in the width of the continental shelf, which may be only a few miles wide off the coast of one state, and several hundred miles wide off another. The Geneva Convention, in avoiding the demarcation of a clear-cut limit, simply postponed the day of decision.

Most authorities feel that some limit is necessary at some point short of mid-ocean, and that beyond that limit, the sea bottom is international in character. However, there is no jurisdiction or set of rules to govern exploitation in this international area. Indeed, there are not even any widely held principles upon which such a jurisdiction could be built. The seas' bottom might be considered as *res nullius*—no one's property—and therefore subject to appropriation. Or it might be considered (as is accepted for the fish in the superjacent waters) as *res communes*—the property of the world community—and therefore not subject to unilateral appropriation. If the former view holds, then the sea bottom is up for grabs—to be appropriated by the first party to make its claim and defend it successfully. Under the latter view, rights to the sea bottom would have to be constrained by some concept of the public interest. Arguments pro and con both views can be developed extensively, but they will not obviate the need for the establishment of some jurisdiction and some set of rules to govern the exploitation of the bottom of the sea.

THE ECONOMICS OF MANGANESE NODULES

Much of what can be said about the economics of the mining of manganese nodules must be speculative in nature. But there is enough information to indicate some of the outstanding characteristics of such an enterprise.¹

¹ See John L. Mero, *The Mineral Resources of the Sea* (New York: Elsevier Publishing Co., 1965) and David B. Brooks, *Low-Grade and Nonconventional Sources of Manganese* (Washington: Resources for the Future, Inc., distributed by The Johns Hopkins Press, 1966).

One important characteristic is the size of the initial investment. Estimates range from the tens of millions to \$300 million for the initial capital investment including the ship and its equipment and the design and construction of a processing plant. In addition, the operation will require a high degree of technological competence in many areas. The high costs plus the technological requirements will operate as impediments to entry and will mean that initial development is likely to be limited to the developed and technologically advanced nations.

A more interesting characteristic is that the most reasonable scale of operation appears to be so large that great quantities of minerals could be produced by a single enterprise. These quantities are likely to be large enough to have a significant effect on the market. David Brooks has guessed that at medium levels of output, the amount of manganese thrown on the market by a single firm would be so large that the price might drop from 90¢ per unit (1963 estimated price) to 50¢ per unit.² The price of cobalt might drop from \$1.50 per pound to \$1.00; and that of nickel from 70¢ to 65¢ a pound. These figures are not to be taken as gospel, but as illustrations of the magnitude of the scale of output.

While this points up the dramatic possibilities for providing vast new sources of supply of manganese, cobalt, nickel, and copper, it also points up the problems that would be associated with multiple ventures. It is a situation where, in the short run, the marginal producer could so significantly affect the market that all prices—and revenues—would be depressed to the point where all operation might become uneconomical. Undoubtedly, through one means or another, the producers would seek to control output in order to protect themselves from this result and to allow for an orderly expansion of the market. But such controls may be difficult in view of the international character of the resource.

A third characteristic important to the discussion of alternative regimes is that the value of different nodule-bearing lands is not likely to be uniform. Different areas produce nodules with different metallic content; some richer as a whole and some richer in certain metals. The density of the nodules on the sea floor varies, as does the depth in which the nodules lie. There are also differences in the character of the bottom which will affect the ease of dredging. And in addition, there are differences in storm hazard and in distance from land. Each of these factors will have some effect on the value of a specific location for nodule mining, just as similar factors affect the value of mineral property rights on land. On land, these differences in value are reflected in price paid for exclusive rights, whether the price is paid directly or indirectly through lease, fee, bid, or other means.

The size of area that a single operation would cover in a year would depend upon a large number of factors, but some rough guess might be made on the basis of John Mero's estimates of the quantity of nodules that could be handled by a single vessel.³ Assuming a throughput of 4,000 tons of nodules per day; the density of nodules on the bottom of two pounds per square foot; and a sweep efficiency of 70%; the operation would cover 60 square miles in a year. While the density of nodules might be higher than two pounds per square foot, the overall sweep efficiency might be much lower in view of the difficulty in maintaining controls precise enough to prevent overlap of sweeps. If this estimate is within a reasonable order of magnitude and if twenty years of tenure is a reasonable requirement, the exploiter should be assured of exclusive rights to an area in excess of a thousand square miles. While these are very rough speculations, they do indicate that competition might become severe for those areas that have high potential value, particularly if those areas are located on the tops of relatively small seamounts.

CRITERIA

In considering the alternative regimes, the basic objective is to arrive at that regime that will be viable over the long-run and that will encourage the economically efficient, peaceful, and orderly exploitation of the minerals of the sea floor. Its success will be measured against three criteria. First, it must permit economically efficient operations. Second, it must be acceptable to a sufficient number of nations both in the long and the short run. And third, it must be feasible.

² Brooks, *op. cit.*, p. 105.

³ Mero, *op. cit.*, p. 267.

The prime requirement for an economically efficient operation is the assurance of exclusive rights for a sufficiently large area for a sufficient length of time. These rights should be adequate to permit both exploration and exploitation, as they do for the oil leases on the U.S. continental shelf. Economic efficiency should be considered not only in terms of the entrepreneur, but also in terms of society. Social costs, such as those for protecting the entrepreneur's exclusive rights, of ensuring an efficient allocation of capital and labor, and, possibly, of preventing external effects (such as pollution) must also be considered in the measurement of benefits and costs by which efficiency is gauged. Efficient management programs for the minerals of the sea floor may require some payment to the public, whether the public be of the flag nation or of the world community.

The second criterion is that of acceptability. The implementation and viability of any regime will depend upon how it is viewed by those nations that have an influence on the decisions. This is essentially the question of how the regime affects the distribution of the wealth of the seas' bottom—or, more accurately, how each participant perceives his own net gains (economic and other) in relationship to the net gains of all other participants.

Assuming that the two criteria mentioned above can be met, the third test of a legal regime is that of feasibility. To meet this test, it may be necessary to develop new institutions—institutions for administration, enforcement, and adjudication. The necessity for new institutions should not be considered an impediment to the establishment of regime. Indeed, it is in keeping that these totally new resources and totally new problems should require new institutions.

There are four general alternatives that may be considered in the search for a regime to govern the minerals of the sea floor. One alternative is to do nothing—to “wait and see” what emerges from actual development before attempting to establish a regime. A second alternative—that might be called the “coastal state” or “national lake” approach⁴—is to divide up the oceans along lines that are equidistant from the shores of the coastal states. The third system—referred to as the “flag nation” approach⁵—would permit exploitation under the jurisdiction, and with the protection, of the nation whose flag is flown by the discoverer and exploiter. And the fourth approach is to permit exploitation under the jurisdiction, and with the protection, of an international authority.

WAIT AND SEE

The first approach is to do nothing about the establishment of a regime until the issue is forced subsequent to the actual development of manganese mining operations. In discussing the pros and cons of the “wait and see” approach, four questions can be raised:

1. Is exploitation likely to be deterred by the absence of a regime under which the exploiter can gain and maintain exclusive rights to a resource area?
2. Can the necessary rules and regulations be written with sufficient precision prior to the actual development of mining operations?
3. When development occurs and the pressures for a regime have to be met, can international law be formulated quickly enough to accommodate the needs of the developers and to resolve the conflicts that may occur?
4. What effect will the pioneer developments have upon the formulation of law and the establishment of a regime?

The first question can best be answered by those companies that have a strong interest in undertaking mining operations. There are those that maintain that the absence of a regime for exclusive rights will not deter investment in a mining operation. They may feel that the seas are so large and the resources so vast that there is no need to establish exclusive rights. Or they may feel that once an operation is underway, their government will be forced to protect their investment.

⁴ The “national lakes” terms, applied to fisheries, has been used by Wilbert M. Chapman in an excellent presentation of the pros and cons of alternative regimes for high seas fisheries. Many of the points he makes are also relevant to discussion of deep sea minerals. See Chapman, “Problems of the North Pacific and Atlantic Fisheries,” (paper presented at the annual meeting, Fisheries Council of Canada, Montreal, May 10, 1967).

⁵ See Northcutt Ely, “The Laws Governing Exploitation of the Minerals Beneath the Sea,” *Exploiting the Ocean Transactions of the 2d Annual MTS Conference* (Washington, D.C.: Marine Technology Society, 1966).

The contrary view holds that the absence of a regime to protect rights will indeed deter investment in a mining operation. Northcutt Ely has pointed out that "the petroleum and mining industries, whether operating on dry land or beneath the sea, require two things above all to attract capital to the ultra-risky business of exploring for minerals; the discoverer's exclusive right to exploit the minerals discovered and security of tenure while he does so."⁶

I do not think, however, that there can be an absolute answer to this question with respect to the pioneer efforts. The inability to acquire a clear-cut exclusive right is simply an additional cost to be considered in the total calculation of anticipated costs and revenues. It is a risk that the entrepreneur may be willing or unwilling to bear, depending upon how he evaluates that risk. If he thinks that the risk is small and that the potential rewards are great, he will make the investment.

The real question, therefore, is the *degree* to which the absence of a regime acts as a deterrent to investment. How significant is the risk? How large is the probability that the entrepreneur will lose access to the resource? There are several elements that can be raised in answering this question. One is the length of tenure required by the exploiter. The heavy capital investment and many technical uncertainties may call for a tenure of many years. On the other hand, the mining operation is mobile, so that loss of access to one area may be balanced by gain of access to another area. This, however, assumes that different areas may be similar in value and that the costs of discovery are not great. And it also assumes that the principle that prevents access to one area does not apply to the other.

In other words, the risk of proceeding in the absence of a regime depends upon one's anticipation of the political opposition to such an operation, an evaluation of the length of tenure required, of the relative values of different areas, and of the costs of discovery. In my own opinion, this leads to an extremely high risk, and one that can be avoided by the establishment of a viable regime for the minerals of the sea floor.

The second question refers to the precision with which the necessary rules and regulations can be written in the absence of experience. It has been suggested that since the rules cannot be written with precision, we cannot, therefore, establish a regime.⁷ In answering this question, we should determine, first, what rules are necessary, and second, what degree of precision in rules is required to permit efficient exploitation.

With respect to the establishment of a jurisdiction over the resources of the sea bottom, it is not clear that it is *necessary* to have more knowledge about the resources than we now have. Certainly, the absence of knowledge and the imprecision of rules and regulations did not prevent the signing of the Truman Proclamation of 1945—the proclamation that established U.S. jurisdiction over the resources of the continental shelf. Nor does it appear that the absence of such knowledge need prevent the establishment of a jurisdiction (be it coastal state, flag nation, or international) over the resources of the deep sea bottom. More knowledge would be desirable, but perhaps not necessary.

When it comes to writing rules and regulations, the problem is one of *degree* and *kind* of knowledge necessary to achieve *sufficient* preciseness. It is not a matter of waiting until all possibly relevant knowledge has been gained before writing the codes, but a matter of anticipating needs and of writing codes with sufficient flexibility to respond to changed conditions. The most important information is not the extent of the resources or conditions of marketing and processing (as suggested in the NOA NEWS), but the size of area and the length of tenure that an exploiter would require in order to operate efficiently. Under the "wait and see" approach, this knowledge might be gained through experience. Under any other approach, some guesses would have to be made for the pioneer exploiters; guesses that could be adjusted as experience is gained. This is a typical approach. For example, oil fields were opened at the turn of the century under certain property rights. Subsequently, it became necessary to

⁶ *Ibid.*, p. 377.

⁷ See "NOA 'Strongly Opposes' United Nations Take-Over of Ocean Minerals," National Oceanography Association NEWS, I, 9 (May 1967). Actually, these suggestions have been made with reference to an international regime, not to any regime. But it seems to me that *any* regime, flag nation or international, will require certain rules and regulations, and that the same knowledge will be required in all cases. See the following discussion on the flag nation approach.

modify these rights in order to prevent excessively rapid output from a common pool. Again, it would be desirable to have more knowledge about the rights that an exploiter would require, but it does not seem that the absence of such knowledge need prevent the establishment of some high seas regime.

The third question relates to the speed with which international law can be formulated to meet the requirements placed upon it. One of the arguments that has been advanced against the establishment of an international regime (and I would guess that this would have to apply to any regime) is that a regime is not necessary; that after the conflict or controversy emerges, international law can respond quickly enough to resolve the conflict through the formulation of the necessary rules. This, it seems to me, depends upon the prize that's at stake and upon how nations anticipate obtaining a share of the prize. I would doubt that nations could reach speedy decisions on such an issue as the division of the wealth of the seas. Certainly no speedy decision has been reached on the width of the territorial sea. In view of this, it seems to me that we cannot rely on a speedy and satisfactory evolution of international law, but must plan now for the eventualities of the future.

The final question is how a future regime would be affected and shaped by developments occurring before a regime is established. That is, if we postpone the establishment of a regime, will we find ourselves locked into an undesirable position because of the pressures stimulated by the initial developments? The answer to this question is obviously speculative. I would guess that it would depend, in part, upon where the pioneer development takes place and by whom.

If, for example, the pioneer effort takes place within the range of what a coastal state conceives to be its interest, that state may attempt to establish its interest by advocating a "national lakes" approach. In further speculation, if that state is one of the less developed nations, it may be joined in its advocacy by many others. If these pressures are successful, and a "national lakes" regime is adopted, the result, as pointed out later, is not likely to be either desirable or viable over the long run.

Other speculations might lead to different results, depending upon how one plays this game. But what is important is not the speculations but the awareness that a "wait and see" approach may lead us into a situation that we would find detrimental and difficult to change. It could, of course, have an opposite effect and result in a desirable regime. But the outcome is unclear, and not likely to be influenced by wishful thinking.

In reviewing the pros and cons of the "wait and see" approach, it appears to me that it would be neither desirable nor necessary to await the development of a sea mining enterprise. The absence of a regime is, I believe, a significant deterrent to exploitation. A regime can be established on the basis of present information. To delay the establishment until development takes place will be to leave the decision in the hands of chance. We should begin now to formulate the law, to set forth the ground rules, and to work towards the establishment of the best regime possible. There is an urgent and immediate need for constructive, open discussion of the various alternatives.

NATIONAL LAKE

Of these alternatives, the national lake or coastal state approach has a great deal of superficial appeal. The exploitability criterion of the Convention on the Continental Shelf opens the way for appropriating larger and larger areas of the sea bottom adjacent to our coasts. By accepting or asserting this convention as a valid guide for the deep seas we could extend our jurisdiction across the sea bottom until we reach a point midway between our shores and those of an opposite coastal state. The attraction to the U.S. is that we have long coastlines on the Atlantic and Pacific Oceans and the Gulf of Mexico.

There are some advantages to dividing up the bottom of the sea among the coastal states. This regime would permit each state to lease and protect exclusive rights to the resources within its area. Each coastal state could extend its administrative techniques out to deep water, permitting as rapid or as slow a development as it deemed economical. If it did not care to exploit the resources itself, it could lease rights to foreign companies and extract a royalty income. This solution, at least on the surface, appears clean and easy. But there are some major drawbacks.

The drawbacks can best be illustrated by examining a map of the world. Islands play a particularly important role in this examination, because of their

strategic location off the coasts of the continents. According to the continental shelf convention, islands have the same rights as mainlands, and, indeed, it is difficult to see how they could be excluded. Thus, the French and the British would be among the chief beneficiaries of the national lake approach. The French would receive a vast area of the Indian Ocean because of Kerguelen, Crozet, and other islands. And they also would get a large area of the eastern tropical Pacific, in part because of Clipperton Island, a desolate rock lying about 500 miles southwest of Mexico. To the British would go more than half of the South Atlantic Ocean, because of Ascension, St. Helena, Tristan da Cunha, and South Georgia. A large share of the North Atlantic including part of the Blake Terrace would fall to the British because of Bermuda and the Bahamas. The trust territories of the South Pacific would be virtually impossible to divide.

The British and the French might find the national lakes approach very attractive, but what about the other powerful nations? The U.S. would win a vast section of the North Pacific, but at the same time, it would find its freedom to operate in all oceans to be severely restricted. Chapman points out that special purpose rights tend to become generalized—that jurisdiction for one use tends toward full sovereignty.⁸ Thus jurisdiction over the bottom may extend upwards through the superjacent waters, and the fish therein, to the surface waters, until all seas become territorial seas. Even if that doesn't happen, U.S. firms, to operate outside of their own waters, would have to deal with a multitude of coastal states. Unlike either of the other two regimes, their investments would be subject to expropriation and their revenues to increased royalties.

More significantly, perhaps, the national lakes approach would provide virtually no gains to the Soviet Union, other than a small slice of the Northwest Pacific and the Barents Sea and Arctic Ocean. It is inconceivable that the Soviets would agree to a regime that would give them so little and the rest of the world so much. And without their agreement, no regime would be viable. Thus, while there are some superficial attractions to the national lakes approach and while it would provide for economically efficient exploitation, it is most unlikely that such a regime would ever become adopted.

FLAG NATION REGIME

The two remaining alternatives, the flag nation and international regimes, are the most important. The flag nation approach bears some similarity to the wait and see approach, on the one hand, and to the international regime, on the other. It appears to be mid-way between the two in terms of time; i.e., between the short and the long run solutions. Ely suggests that "until enough international competition and friction develop to justify creation of some advance licensing scheme for administration by the United Nations, recognition of the flag of the craft or other surface mechanism from which the exploration is controlled, sufficiently identifies the jurisdiction which ought to have plenary control over that exploration and over the exploitation of the resources so discovered."⁹ In short, the flag nation approach *appears* to be simply an intermediary step between no regime and some form of international regime. It may, however, be much more than that since it is likely to have a quite different effect on the distribution of the seas' wealth than would occur under an international approach.

The flag nation approach would presumably permit the exploiter to operate under the protection of the nation whose flag he flies. The exploiter might be an individual firm, a consortium, a mixed public-private enterprise, or a government itself. But in each case the government would be responsible for the assertion and maintenance of the claim of the exploiter. In Ely's words, "the explorer . . . appropriates a segment of the seabed, and the jurisdiction—let us go further and say sovereignty—of his flag attaches to the discovery."¹⁰ If the respective governments are willing to guarantee this protection, and the exploiter feels that the guarantee will be effective over a sufficient length of time, then one of the major deterrents to exploitation will become insignificant.

As development occurs under these guarantees, there will eventually be conflict and competition for the same resource area. If the competition is between

⁸ Chapman, op. cit., p. 2.

⁹ Ely, op. cit., p. 378.

¹⁰ Ibid., p. 377.

two firms flying the same national flag, it can be resolved through some form of bidding mechanism, similar to the arrangement for established and enforced?

If such a rule could be established, there would be further difficulties in terms of the effect on rate of output. As pointed out earlier, a single operation is likely to produce such large quantities of metals as to affect the market for these commodities. A firm, in considering whether or not to enter the industry, would obviously take this into consideration. But the magnitude of output of a single unit would mean that a slight error in judgment could have widespread effects. Furthermore, a performance requirement, if it could be established, would create incentives to produce more rapidly than might be justified economically. That is, the possibility of future returns might well tempt nations to stake claims and operate them even though present returns were unsatisfactory. It would be difficult to set up and enforce rules to prevent these consequences without adopting some form of international authority.

Assuming that there is an international rule established that falls short of an international authority, the flag nation approach faces a more intransigent difficulty in meeting the test of acceptability. This depends, as Mr. Ely points out, in how other nations "sense an interest of their own in the outcome." The assertion of jurisdiction—of sovereign rights—over segments of the sea floor by a few developed and technologically advanced nations, together with rules that effectively prevent the less developed nations from asserting similar claims, is not likely to be widely accepted. The few developed nations might be able to enforce this approach simply by exercising their power, just as the Soviet Union and the United States claimed and maintained exclusive rights to large areas of the ocean for the testing of nuclear weapons. But this power can only be exercised at certain cost. As indicated above, the developed nations may be unwilling to bear this cost. If, however, they are, they would have to be willing to assume greater and greater costs of enforcement as the value of the minerals of the sea floor increase and the incentives grow for the appropriation of exclusive rights.

INTERNATIONAL REGIME

The final alternative—that of an international regime—is, I think, more likely to be acceptable over the long run and more likely to protect the interests of the exploiting firms and permit economically efficient operations. Whether or not it will be feasible will depend upon our ability to develop the required institutions. It is assumed in this paper, that these institutions can best be developed under the auspices of the United Nations, since this is the one public international body that comes closest to meeting the requirements. But note that the criteria of efficiency and acceptability do not require a United Nations agency. Some other international body might work just as well. The United Nations has been selected because it exists and because it can, I think, be used advantageously for this purpose.

To achieve an international regime, the UN authority must acquire jurisdiction over the resources on and under the sea floor. This jurisdiction must permit it to grant and protect exclusive rights of entrepreneurs. The authority must also have the ability to tax or extract rent or royalty payments for the use of the resources. And it must be given the ability to utilize or distribute these revenues in an acceptable manner. Furthermore, some boundaries for the jurisdiction of the authority must be established, just as they must be established under a flag nation approach. It is suggested that these boundaries be as encompassing as is feasible, in order to permit the widest possible exploitation under a single regime.

As a basis for discussion, I will sketch out some suggestions and ideas for the operation of such a regime. The individual entrepreneur, from whatever nation, would bid for the exclusive right to explore and exploit a certain area for a specified resource. This bid might be expressed in terms of royalty payments; i.e., the entrepreneur would agree to pay a certain percentage of the gross revenue from the operation. Other mechanisms might also be possible, such as a bid on percent of net revenue, or on a cash bonus payable in installments.¹¹ For high risk operations, such as manganese mining, the initial bids would obviously be very small. It would not be enough to deter exploitation, and, over the long run, would be no greater than the payments that the exploiting firm would be expected to make under the flag nation approach. Some requirement for performance within a certain period of years should be invoked in order to pre-

¹¹ See David B. Brooks, "Deep Sea Manganese Nodules: From Scientific Phenomenon to World Resource" (forthcoming paper to be presented at the Law of the Sea Institute, June 27, 1967). This is an excellent discussion of institutional conditions necessary for deep sea mining.

vent a race to claim vast regions of the sea. There should also be some inspection scheme to ensure that the rights of the lease are not being abused and that the operation is not damaging the marine environment or making inefficient use of the resource. None of these requirements differs substantially from those relating to the exploitation of oil resources on the U.S. continental shelf. The only difference is that administration is in the hands of an international body rather than the U.S. federal government.

The determination of a boundary between the interests of the coastal states and the interests of the world community is obviously difficult. An international regime, however, may facilitate reaching a decision. For example, a relatively restrained coastal state limit might be selected along with a scheme that would recognize the interests of the coastal state outside of that limit. In other words, where a resource is exploited relatively close to a coastal state, the royalties paid to the international authority would be split between that authority and the adjacent state. The closer to shore, the higher the percentage received by the state; and the farther from shore, the greater the percentage to the authority. This would permit U.S. firms to operate throughout the world's oceans under a single set of rules. Problems of expropriation and inflated royalty rates would be greatly diminished.

It would appear that the international regime would meet the criterion of economic efficiency better than the flag nation approach. The payments to be made to the authority would not be sufficient to deter exploitation. Over the long run, the bidding mechanism would reflect the value of the exclusive rights to the producer and would ensure, through this means, an efficient allocation of resources and distribution of effort over the mineral properties. These payments would be no greater than those required under a flag nation approach, where different firms may be vying for the same resource. An international authority would be better able to prevent excessively rapid rates of output that would depress prices and revenues to all producers. The registration of exclusive rights within a single agency would more likely reduce the possibility of conflict than a situation where no such agency exists.

The most crucial point, however, would lie in the ability of the authority to guarantee and protect the exclusive rights of the exploiters. This ability would depend upon the degree to which the regime is accepted by the world community. Obviously, the simple assertion of authority would carry little weight. But if the regime is widely accepted, then this acceptance alone would probably be sufficient to guarantee the protection of exclusive rights.

The question of acceptability would depend, as noted above, upon how each participant views his net gains against the net gains of all others. For the exploiting nations, the gains would be in terms of orderly development, control over uneconomical rates of exploitation, and a better guarantee of exclusive rights than under a flag nation approach. For the non-exploiting nations, gains would be obtained by a direct sharing of royalties, where exploitation takes place close to their shores, and by an indirect sharing of royalties where exploitation is clearly within international waters. In other words, the mechanism should be worked out so that it is in the mutual interests of all parties to maintain the regime.

The indirect sharing of royalties is essential to meet the criterion of acceptability. The non-exploiting nations would have to feel that they are sharing in the benefits of the regime. This might be accomplished if the revenues were devoted to some purpose generally accepted as beneficial to mankind, such as the reduction of protein malnutrition. The task of the authority, however, would be primarily with respect to management and it should, therefore, reflect the interests of the exploiting nations. The task of revenue distribution or use might be separated from the authority and fall within the province of the General Assembly.

The administration and management of the oil resources of the U.S. continental shelf is analogous to an international authority for the resources of the sea bottom. The continental shelf resources are considered as part of the public domain. The Federal government, as administrator, leases exclusive rights to the exploiters, guarantees these rights, and ensures an orderly rate of exploitation. The revenues received from the cash bonuses and royalty payments are used for the benefit of the public.

APPENDIX 7

WOODS HOLE OCEANOGRAPHIC INSTITUTION,
Woods Hole, Mass., October 17, 1967.

MR. MARIAN CZARNECKI,
*House Foreign Affairs Committee,
Rayburn Building, Washington, D.C.*

DEAR MR. CZARNECKI: Sorry that I will be unable to appear before your committee on economic resources of the sea floor. Perhaps after the ALVIN dives next week and the ECAFE conference in Taiwan on mineral resources of the Asiatic shelf I can set aside some time for your committee.

In hope that they may be useful to you, I am enclosing several reprints on economic resources of the sea floor.

Sincerely,

K. O. EMERY.

Enclosures:

- (1) Human Food from Ocean and Land, article in *Science*, September 15, 1967.
- (2) Some Potential Mineral Resources of the Atlantic Continental Margin (U.S. Geological Survey Prof. Paper 525-C), Contribution No. 1615 of the Woods Hole Oceanographic Institution.
- (3) Geological Methods for Locating Mineral Deposits on the Ocean Floor, reprinted from: "Exploiting the Ocean", Contribution No. 1791 of the Woods Hole Oceanographic Institution.¹

[From *Science*, September 15, 1967]

HUMAN FOOD FROM OCEAN AND LAND

(By K. O. Emery and C. O'D. Iselin)²

During recent years many claims have been made about the importance of the ocean to man's future well-being. Some of these claims appear to us to be reasonable, whereas others have an Alice-in-Wonderland quality. As a basis for judgment in this matter, we have compiled a table that shows our estimate of the tonnage and dollar value of food derived from the ocean as compared with that derived from the land during 1964, the latest year for which statistics are reasonably complete. The difference in the former productivity of the ocean and the land is so great as to suggest that an enormous effort will be required before the production of the ocean can be comparable with that of the land.

A sort of genetic classification of food resources was used to compare the present stages of technology in the ocean and on the land. For plants, the primitive stage is that of gathering wild plants (on land—berries, nuts, mushrooms, herbs); the next stage is farming (whereby seed are planted and the plants are tended and then harvested). For animals, the primitive stage is that of hunting wild animals for food (on land—deer, rabbits, quail); the next stage is herding (whereby selected breeding, culling of young, and controlled slaughter are practiced along with the nondestructive taking of byproducts such as eggs, milk, and wool). This terminology, gathering and farming of plants, and hunting and herding of animals, is also applied to the ocean in a strict sense. For example, we consider that only algae or bacteria can be farmed, and that oysters, clams, and fish can be herded (not farmed) as an improvement over catching them in their wild state. Note that nonedible materials such as lumber, whale oil, shells, pearls, wool, hides, and fertilizer are not included in this study.

DATA

The production figures (Table 1) are uneven in quality. Some figures, such as those for fishing, herding, and farming are reasonably well known and have

¹ Retained in the subcommittee file.

² The authors are members of the staff of Woods Hole Oceanographic Institution, Woods Hole, Mass.

been reproduced in many publications. Others, such as for gathering and hunting on land, must be based upon judgment guided by scanty measurements. The data for the United States are far better than those for the whole world, so they are presented separately. Tonnages are expressed in wet weight or live weight as usually reported, and dollar values are for the level of the fisherman, farmer, or hunter; values at the retailer level would be much higher.

Data for the gathering of seaweed were compiled by the Battelle Institute (1), but the quantity and value of wild plants gathered from land is so poorly known that only rough estimates by the writers can be given. Production of plants by the more advanced stage of farming is better established. Essentially no farming of the ocean takes place in the United States; almost all of it is in Japan, where algae used largely for flavoring is grown on racks in broad bays near shore. Data for the Japanese production is from the Battelle Institute (1) supplemented by information obtained by Emery during a recent visit to Japan.

TABLE 1.—TONNAGE AND DOLLAR VALUE OF HUMAN FOOD PRODUCED FROM OCEAN AND LAND DURING 1964. THE U.S. POPULATION IN 1964 WAS 0.19 BILLION; THE POPULATION OF THE ENTIRE WORLD WAS 3.22 BILLION. FIGURES IN PARENTHESES ARE LESS ACCURATE THAN THE OTHERS WHICH ARE BELIEVED TO BE ACCURATE WITHIN ± 25 PERCENT

Activity	Tonnage (millions/years)				Dollars (billions/year)			
	United States		World		United States		World	
	Ocean	Land	Ocean	Land	Ocean	Land	Ocean	Land
Plants:								
Gathering.....	0.01	(2)	0.02	(100)	0.02	(0.1)	0.04	(5)
Farming.....	0	230	0.1	2,000	0	17.0	(.01)	100
Animals:								
Hunting.....	1.6	(1.3)	29	(27)	.3	(.6)	4.4	(11)
Herding.....	(.01)	85	(.6)	520	(.01)	22.0	.2	120
Minerals: Mining.....					.7	20.0	3.6	73

Rather complete data on farm production in the United States and for the entire world was compiled by the U.S. Department of Agriculture (2). The dollar value for the United States farm income (Table 1) is also readily available from the USDA and from current commodity prices, but that for the entire world had to be computed on the basis of a price per ton somewhat lower than that for the United States.

Data for the hunting of animals in the ocean are fairly good, having been compiled by the Food and Agriculture Organization of the United Nations (3) and interpreted by Chapman (4). A total of 51.6 million tons of fish, mollusks, crustaceans, and small mammals were taken commercially in 1964. After removal of 16.4 million tons not used directly for human consumption and 6.6 million tons of freshwater fish, the remainder is 28.6 million tons, of which only 1.5 million tons were caught by the United States fishermen. To both the world and the United States totals for commercial fishing must be added a small quantity representing products of saltwater sport fishing and other noncommercial fishing. The totals are about 1.6 and 29 million tons, respectively. The tonnages given in Table 1 are also expressed in dollars on the basis of an average price to the fisherman of \$200 per ton in the United States and \$150 per ton in the rest of the world. Note that these prices are for only the high-grade fish that are used directly for human consumption.

Information about the quantity of animal food obtained by hunting on land is as inadequate as that for plant food which is gathered on land. The Bureau of Sport Fishing and Wildlife (5) compiled the number of deer, elk, and other big game that were legally shot during 1964 in the United States. These numbers were converted to tons (152,000) on the basis of average weights of each kind of game, and doubled to allow for the take by poaching. This tonnage was trebled to include small game such as rabbits and ducks, figures for which are not available from the bureau. This last estimate is reasonable if the average bag of the 10 million small-game hunters was 10 pounds for each of their 128 million "recreation days" (6). The total bag is then about 1 million tons, to which 0.3 million tons must be added for freshwater fish (4). The total value was computed on the basis of \$500 per ton for mammals and \$200 for fish—commercial prices for pork and desirable marine fish. Had the tonnage been evaluated on the basis of the \$4 billion spent by sportsmen (6), the cost per ton would have been \$3,000; ob-

viously, the sportsmen buy fresh air and exercise rather than meat. For the entire world, the take of freshwater fish amounted to 6.6 million tons in 1964 (3, 4), and the mammals that were hunted on land were guessed at 20 million tons (no data are known to the writers). The values were computed as for the United States.

Figures for the herding of animals are reasonably good. Only a minor quantity of oysters and clams are cultivated in the United States, but a serious attempt is being made in Japan where not only oysters and clams, but also squid, shrimp, crabs, and yellowtail fish (*Seriola*) are being cultivated—all, so far, at costs in excess of those for the hunting of the wild animals. According to a compilation (7), the tonnage for Japanese "aquaculture" is about 0.5 million for 1964; that for the rest of the world may be another 20 percent (Table 1). Production by herding of animals on land also is well summarized by the USDA (2, 8). About three-quarters of this total is milk, cheese, and eggs; only one-quarter is meat. The dollar value is from the USDA's tabulation of farm income from livestock. The world's total for herding was tabulated by the USDA (2), but the dollar value was computed by the writers on a somewhat lower unit basis than for the United States.

For comparison with food resources, the value of minerals from the ocean and land are included in Table 1 from a previous compilation of Emery (9). Of these mineral resources, petroleum and natural gas are by far the greatest. In terms of energy, the 1.6 billion barrels of petroleum produced from the ocean floor during 1964 corresponded to 2.5×10^{15} kilogram calorie, and the total oil, gas, and coal that was produced on land and sea floor throughout the entire world during 1964 (9) was equivalent to about 47×10^{15} kilogram calorie. In contrast, the 2360 kilogram calorie average daily food intake of the world's human population (2) totals about 0.008×10^{15} kilogram calories, but about half of this energy is required merely to maintain bodily functions, leaving only about 0.004×10^{15} kilogram calories of human energy to compete with the more than 10,000 times greater annual supply of energy from fossil fuels.

CONCLUSIONS

The figures in Table 1 yield some interesting results. The total annual value of food and mineral resources taken from the ocean is \$8.3 billion, in contrast to \$309 billion from the land. Using the land value as the yardstick, if the annual value of produce from the ocean were in ratio to the area relationship of ocean and land, the ocean potential would be \$750 billion; the actual recovery of 1964 was only 1.1 percent of that potential. This very low percentage is the basis for either great optimism for the future development of the ocean (on the basis of unrealized potential), or great pessimism (on the basis of high costs compared with further development of land resources, or present exploration to near the limit of productivity.)

Closer inspection of Table 1 indicates that the development of the marine food resources is in a more primitive stage than the development of the resources on land. For example, far more food is recovered from the ocean by primitive techniques of gathering and hunting than by farming and herding. The situation is greatly reversed on land with most recovery by farming and herding. Progress toward the more advanced stages of food recovery in the ocean is inhibited by political factors (failure of governments to agree on ownership of the ocean and its often mobile food resources), by economic factors (high capital costs of harvesting equipment as compared with costs ashore, and high labor costs under union control), esthetic and tradition factors (tastes, customs, and religious prejudices regarding food—witness the difficulty in securing acceptance by the Food and Drug Administration of fish protein concentrate, the reluctance of Americans to eat squid, and of Orthodox Jews to eat shrimp), and industrial factors (conservative design of fishing boats and equipment, and the preference of American fishermen for small independent boats rather than the large ocean factory ships used by the Soviets and Japanese).

Although the world fishery has been increasing quite rapidly in recent years and the trend is likely to continue as more efficient fishing methods come into wider use, the total yield continues to be very small as compared with that from the land. The apparent reasons for this situation have been thoroughly discussed by others (10); nevertheless, considerable controversy exists about whether the ocean can support much more efficient and intensive hunting (11). Has overkill been reached for oysters, lobsters, abalone, sardines, tuna, and whales just as it

was reached earlier on land for elephants, buffalos, and passenger pigeons? If hunting has reached its practical limit, then the only way of increasing the food resources of the ocean is by cultivation—of plants by farming and of animals by herding. The high value per ton of animals has led to some initial efforts in herding, particularly in Japan. Probably these efforts will continue and even increase although the cost of catching food for the captive animals and for confining them presently exceeds the cost of catching the desired animals in their wild state.

Since farming is far closer to the energy source on the complex and inefficient food pyramid than is herding, one should expect greater rewards from farming than from herding. However, farming of the ocean (for plants) has as its major obstacle the difficulty of harvesting. Most of the bulk of plants that live in the ocean are microscopic in size and they are distributed in three dimensions. The cost (energy) of harvesting them exceeds the value (energy) that is recovered by eating (or burning) the crop. Near shore in clear water larger attached algae can be grown, but most of them are not particularly tasty and few are used directly as food. We do not know of a single experimental project in the United States that is designed to farm the ocean! Many projects investigate laboratory aspects of photosynthesis, plant physiology, and biochemistry, but none appear to be making direct tests of planting and harvesting in the ocean. One answer is that "we must understand the processes before they can be utilized," but we may ask in return "how well did early man understand photosynthesis and biochemistry when he improved and adapted to farming the primitive corn and other wild plants that he had encountered in his gathering stage of economy?"

These major conclusions from the study are quite self-evident, but for readers who have not looked into the literature of marine science the following remarks may be helpful:

(1) Photosynthetic production in the ocean is compared to that on land, although great regional variations in productivity exist in both environments. Since the area of the ocean is nearly three times that of the land, the potential harvest is proportionally large, even without equivalent agricultural practices.

(2) The old concept of the freedom of the seas, which developed because the ocean was considered nearly worthless except for cheap transportation and defense, is diametrically opposed to wise utilization of the seas.

(3) Fishermen prefer to sell fresh fish because the price is much higher than for the so-called "trash" fish, which are being increasingly processed into fish meal as an additive for chicken and cattle food. Fish flour, a more refined product that is fit for human consumption, is just coming onto the market; it is an efficient source of cheap protein for the human diet.

(4) Fishermen are likely to remain hunters rather than herders or farmers unless responsibility is clearly defined for management of the biological resources available in the saltwater envelope that covers so much of the world. For some resources national agencies can be adequate, but for others some international agency is needed.

[From Geological Survey Research 1965]

SOME POTENTIAL MINERAL RESOURCES OF THE ATLANTIC CONTINENTAL MARGIN¹

(By K. O. EMERY, Woods Hole, Mass.)

Abstract.—Preliminary findings from a current geological investigation indicate that the continental shelf and the upper part of the continental slope off the Atlantic coast of the United States may be the site of large deposits of construction sand, phosphorite, manganese oxide, and petroleum. The sand covers most of the continental shelf, the phosphorite occurs near the top of the continental slope and its southward extension inshore of the Blake Plateau, and manganese nodules are common on the Blake Plateau. Petroleum source beds and structures appear to be most favorable along (1) a seaward extension of the Cape Fear Arch, (2) the outer part of the continental shelf from south of Boston northeastward probably to the Grand Banks of Newfoundland, and (3) a probable fault zone southeast of New York City.

¹ Contribution No. 1615 of the Woods Hole Oceanographic Institution.

A broad regional study of the geology of the continental shelf and slope off the Atlantic coast of the United States was begun in late 1962 as a joint program of the U.S. Geological Survey and the Woods Hole Oceanographic Institution (Emery and Schlee, 1963). The study includes investigations of topography, sediments, lithology, and geological structure. By the end of 1964 a topographic compilation was completed, with a series of four general charts and many more-detailed small ones (Uchupi, 1965; R. M. Pratt, report in preparation). General sampling of the sea floor also was nearly finished, with about 1,800 large surface samples from an 18-kilometer grid that extends from shore to depths as great as 4,000 meters. In addition, about 8,000 km of continuous seismic profiles were run at 50- to 100-km spacing. Preliminary examination of the results permits the outlining of the shallower portions of the region that are most likely to contain mineral deposits of economic value (fig. 1). Additional detailed dredging and study of geological and geophysical data should narrow the areas of maximum interest and possibly reveal additional areas not shown by figure 1.

SAND AND GRAVEL

The most widespread resource to be exploited from the surface of the continental shelf is probably sand and gravel for construction use as concrete aggregate, road material, and material for beach widening. As shown by D'Amico (1964), the value of sand and gravel quarried on land in the United States during 1963 was \$849 million, or about 20 percent of the total value of all nonmetallic minerals other than fuels. For sea-floor operations, this relation is apt to be more heavily weighted in favor of sand and gravel because of the wide distribution, great thickness, lack of overburden, and cheap barge transportation of these materials. The samples that have been obtained to date show relict sand to present throughout most of the length of the continental shelf, extending from an average depth below sea level of about 20 m to a depth of 80 to 140 m near the shelf edge (fig. 1). Thickness of the sand is as much as 60 m. The sand consists mainly of quartz and feldspar, and it is coarser grained than the modern sediment occurring both landward and seaward of it. Sediment on the shelf just north of Miami is highly calcareous and thus is unsuitable for many construction purposes. Surface sediment in the Gulf of Maine (off Boston and Portland, fig. 1) consists chiefly of silty clay and poorly sorted mixtures of clay, silt, sand, and gravel.

The relict nature of the sand on most of the continental shelf is indicated by a grain size coarser than that of sand nearer shore, and by the typical presence of iron stain and solution pits. The relict sand also contains occasional shells of the common edible oyster that normally lives at depths of only a few meters within coastal estuaries and lagoons. Radiocarbon ages obtained for several specimens range from 8,000 to 11,000 years (Merrill and others, 1965). In summary, the relict sand appears to consist of ancient shore deposits that were formed as the ocean transgressed the continental shelf at the end of the latest glacial epoch. Supporting evidence for that environment of deposition is given by the presence of submerged terraces and beach ridges on the shelf. The independence of the offshore relict sand from the inshore modern sand means that the relict sand probably can be mined without disturbing the shoreline equilibrium.

Gravel is subordinate to sand on the continental shelf, it may be abundant in two general areas. One of these is a large gravel fan off New York City, where gravel must have been deposited by the Hudson River as a sheet perhaps in a manner similar to that of the widespread gravels on the Atlantic Coastal Plain (Schlee, 1957; 1964). The other area is atop the northern margin of Georges Bank (the shelf projection southeast of Boston, fig. 1), where residual gravels from glacial till, glacial outwash, and Tertiary strata have been concentrated by the winnowing action of tidal currents.



FIGURE 1.—Distribution of the most favorable areas for some potential mineral resources off the Atlantic coast of the United States. The dashed line denotes the position of the edge of the continental shelf, about 80 m deep in the south and about 140 m in the north. The area indicated for manganese nodules corresponds to the surface of the Blake Plateau.

PHOSPHORITE

Phosphorite nodules occur in many surface samples from beyond the edge of the continental shelf. They appear to be most abundant between depths of about 200 and 500 m on the East Florida Escarpment, a 1° slope that leads downward from the continental shelf to the Blake Plateau (fig. 1). They are present but probably less abundant on the top few hundred meters of the continental slope between the Blake Plateau and the vicinity of New York City, and they are still less common on the continental slope east of New York City. The nodules are brown dense masses as large as 8 cm in diameter, and they have the X-ray and optical characteristics of apatite.

The phosphorite is associated with glauconite. Both materials are authigenic deposits and are typical of shallow sea-floor environments that have a very low rate of accumulation of detrital or biogenic sediments. The area of their maximum concentration is just such an environment. However, there is a strong probability that the phosphorite is residual from weathering and erosion of outcrops of phosphatic strata. On the adjacent land several Miocene and Pliocene formations contain phosphorite that is exploited chiefly for fertilizer. The seaward regional dip should permit these formations to crop out on the slope, if the slope is a fault partly mantled with sediments, as Sheridan and others (1965) indicate is true of the East Florida Escarpment. Topographic irregularities on the slopes also suggest that narrow structural terraces were developed by outcrops of resistant strata (Heezen and others, 1959). The question of quantity and quality of the phosphorite can be determined only by detailed sampling and laboratory analyses. During 1963 the total value of phosphorite mined on land in the United States was only about \$140 million (D'Amico, 1964); thus mining of it from the sea floor may be uneconomical.

MANGANESE NODULES

Many samples and bottom photographs (Pratt, 1963) have shown an abundance of nodules and crusts of manganese oxide on the Blake Plateau (fig. 1) between depths of 750 and 1,050 m. The nodules occur in a thin blanket of globigerina and pteropod ooze lying on Pliocene and Miocene limestones. They range in size from sand grains to flat masses nearly a meter in length, but the majority are subspherical nodules 10 to 20 cm in diameter. The encrustations are solid-looking coatings on the bottom, covering continuous areas of at least 10 sq m, the space depicted by underwater photographs that show them; they are rarely if ever removed by sampling devices.

Analyses reported by Mero (1960, 1962) suggest that the nodules from the Blake Plateau are of low quality for metallurgical purposes as compared with those that have been dredged from the deep-sea floor of the Pacific Ocean. However, it is possible that higher quality nodules occur at the seaward side of the Blake Plateau, which is more distant from diluting detrital sediments. The nearness of the Blake Plateau to ports and its relatively shallow depth may permit this area of the sea floor to be one of the first to be economically exploited for manganese. The total value of manganese of comparable quality mined in the United States during 1961 was only about \$1.5 million (D'Amico, 1964), but the manganese nodules from the sea floor contain trace elements (mainly cobalt, nickel, and copper) perhaps more valuable than their manganese matrix.

PETROLEUM

A sizable fraction of the oil and gas production of the world already comes from the shallow sea floor off the coasts of the United States and Europe, and in the Persian Gulf. The Atlantic Coastal Plain sediments are not very petroliferous, but farther seaward these sediments become thicker, more marine, and possibly better source beds of petroleum. Suitable petroleum-bearing structures may be associated with large tectonic structures that exist in three main areas shown by figure 1. The southern area is along a seaward extension of the Cape Fear arch, which is well known on the adjacent land. A second area just southeast of New York City follows a major strike-slip fault. The northern area underlies the continental shelf between two tectonic troughs mapped by Drake and others (1959). The basement rock of the ridge between the troughs is overlain by 1.5 to 2.5 km of Cretaceous to Pliocene strata. Farther southwest the ridge underlies deep water of the continental slope, but farther northeast it becomes shallower in the vicinity of Sable Island (beyond the limits of fig. 1) and it probably extends to the northwestern part of the Grand Banks of Newfoundland. Detailed geophysical exploration may reveal the presence of isolated high portions of the ridge worthy of testing by drilling.

At the base of the continental slope is a broad gently sloping feature, the continental rise. Continuous seismic profiling indicates that it consists of numerous interbedded strata of alternating high and low acoustic impedance. These layers probably consist of sandy turbidites separated by clayey hemipelagic beds—a flyschlike deposit. Future testing by drilling may show that the clays are petroleum source beds and that the sands are reservoir beds (Emery, 1963).

CONCLUSIONS

Areas having particular potential for construction sand, phosphorite, manganese nodules, and petroleum have been outlined in a general way (fig. 1) from preliminary results of a continuing study of the Atlantic continental margin. Further planned investigation should pinpoint the best parts of these areas for such resources. Whether any of them will eventually be exploited depends upon future developments in marine engineering and a favorable cost-price relation.

APPENDIX 8

INSTITUTE OF MARINE SCIENCE,
UNIVERSITY OF MIAMI,
Miami, Fla., October 24, 1967.

Hon. DANTE B. FASCELL,
Rayburn House Office Building,
Washington, D.C.

DEAR DANTE: At the request of Mr. Czarnecki, I am sending 15 copies of my report to the President's Council on Marine Resources and Engineering Development. Mr. Czarnecki also kindly invited me to testify before the House Committee for Foreign Affairs. Unfortunately it looks as though I will be unable to fit this in during the coming month, but I do appreciate the invitation and will try to fix a date later.

In speaking for the academic oceanographic institutions I can say that we are not so directly involved in the commercial exploring and exploiting of ocean resources as the Government agencies are. We do have a very strong indirect interest, however, inasmuch as most of the purely scientific exploration of the seas has been carried out by universities and this has provided many new leads to possibilities of exploitable wealth. Government agencies and industry usually function from there on, turning these leads into direct means of practical exploitation. What is perhaps even more important, however, is that the practical utilization of resources does depend upon the adequate supply of manpower to both government agencies and industry. The universities are of course the prime sources of this manpower, so that in a very true sense commercial exploitation depends finally upon our educational activities.

With best personal regards.

Sincerely yours,

F. G. WALTON SMITH,
Director, Chairman, COLD.

Enclosure :

THE COUNCIL OF OCEANOGRAPHIC LABORATORY DIRECTORS

The Hon. Hubert H. Humphrey, Vice President of the United States, Chairman,
National Council on Marine Resources and Engineering Development.

We respectfully submit for your consideration the attached Report on the Role of Academic Institutions in the Development of Marine Resources and Technology.

Wayne V. Burt, chairman, Department
of Oceanography, Oregon State
University

Richard H. Fleming, director, Depart-
ment of Oceanography, University
of Washington

Richard A. Geyer, head, Department of
Oceanography, Texas A. & M. Uni-
versity

William A. Nierenberg, director, Scripps
Institution of Oceanography, Uni-
versity of California.

Maurice Ewing, director, Lamont Geo-
logical Observatory of Columbia
University

Paul M. Fye, director, Woods Hole
Oceanographic Institution

John A. Knauss, director, Graduate
School of Oceanography, Univer-
sity of Rhode Island

Donald Pritchard, director, Department
of Oceanography, Johns Hopkins
University

George P. Wollard, Institute of Geo-
physics, University of Hawaii

F. G. Walton Smith, chairman, COLD
Institute of Marine Sciences, Uni-
versity of Miami

THE ROLE OF ACADEMIC INSTITUTIONS IN THE DEVELOPMENT OF MARINE RESOURCES AND TECHNOLOGY

REPORT OF THE COUNCIL OF OCEANOGRAPHIC LABORATORY DIRECTORS

1. The Council of Oceanographic Laboratory Directors.
2. The Scope of Oceanography.
3. The Role of the Academic Institutions.
4. Relationships with Mission-Oriented Government Agencies.
5. The Funding of Fundamental Research.
6. The Funding of Mission-Oriented Research.
7. The Funding of Engineering Research.
8. Long-Term and Block Funding.
9. The Sea Grant College Program.
10. Regional Fleet Operation.
11. Research Vessel Operation Funding.
12. Ship Replacements and Additions.
13. Shore Facilities.
14. Oceanographic Manpower and Training.

Appendix I. Notes on the Funding of Fundamental Research.

Appendix II. Notes on Manpower and Training.

1. The Council of Oceanographic Laboratory Directors

The Council represents the ten academic research institutions of the U.S.A. which engage in the field of basic oceanographic science as defined in the following section. It includes all of those institutions which operate seagoing vessels and have permanent qualified staffs and continuing institutional research programs. It does not include a considerable number of smaller institutions which have not met the foregoing criteria, or which are primarily adjuncts of biology of biomedical departments or which are largely for visiting, non-oceanographic scientists or summer students. Thus, it includes all of the pioneer institutions which have been the backbone of the development of oceanographic science and technology during the past thirty years or more and probably represents at least 90 percent of the basic and academic scientific research now being carried on in oceanography.

The institutes do not necessarily follow a common pattern or organization nor are all of them restricted to basic research and education. Some have pioneered in ocean engineering education in recent years. Others have concentrated upon naval applications. Some are engaged in fisheries research, others are not. But, in discussing the role of these institutes, we find strong unifying principles which embrace all of them.

Our purpose here is to outline the vital role which these institutions play in ocean resource development and technology and to describe briefly some of the difficulties which are seriously threatening our efforts to continue effectively this role in future development. We feel that the institutes have not been adequately represented in national policy and, as a result, have received relatively little support and consideration compared to that accorded to other agencies. We hope that the institution of COLD will help to improve this liaison.

2. The Scope of Oceanography

The term oceanography, as generally used today, has come to include a broad spectrum of activities related to the ocean, even including some space activities. These activities have widely differing objectives and functions. They have not been clearly distinguished for budgetary purposes in recent years so that the published figures do not accurately represent the distribution of funds. (See Appendix I) It may therefore be well to redefine them.

At one end of the spectrum is basic oceanographic research, the exercise of intellectual curiosity towards a better understanding of the oceans. This is the primary role of the universities. They are the principal source of knowledge upon which other "oceanographic" activities draw in the exercise of their functions.

The application of basic scientific knowledge in the development and control of mineral, living and other marine resources; to the prediction and control of the environment, including sea and weather; and to the development of offensive and defensive naval systems: these are in general the missions of government agencies.

Finally, engineers apply basic scientific knowledge to the commercial exploitation of the ocean and its resources, ranging over a wide field, including transportation, mining, fishing, and naval systems and hardware. This is the role of industry.

Basic science is primarily, though not exclusively, the function of educational research institutions. It is necessary in the present context to distinguish between the basic scientific disciplines themselves and their coordination in the interdisciplinary field of oceanography, since the objectives and logistics are far apart, although there is obviously some degree of overlap. The oceanographic scientist applies one or more disciplines to the study of the energy and material transformations and translations taking part in the oceans, and across its boundaries and interfaces, including the living membranes of the biological systems within the ocean. In doing so he uses seagoing facilities which may add many times to the cost of research. On the other hand, the scientist working in the basic biological disciplines, for instance, unconcerned with the ocean itself, may yet use a marine animal to study nerve or muscle function, merely because it is a convenient animal for experiment. Similarly the geologist may well look to the sea for information which will help elucidate the nature of the continental sediments. Their use of specialized oceanographic shore and seagoing facilities is minimal and their contribution to our knowledge of the oceans relatively slight, no matter how great their contributions to the basic disciplines themselves.

3. The Role of the Academic Institutions

The task which academic institutions are called upon to undertake in the development of a major national goal, such as the development of marine resources and technology, includes both teaching and research. These institutions are the primary source of trained scientists and engineers, and are therefore an essential foundation to the entire pyramid at the top of which lie industrial utilization and exploitation and in the mid portion of which lie the government agencies.

The roles of the academic institutes are not confined to basic scientific research and training. It is equally necessary to the development of ocean resources and technology that the academic institutions continue to play their role of training engineers. For this purpose it is necessary to develop new curricula and departments which adapt existing engineering training to the technical peculiarities of work in the sea, and to find sources of support for this.

A further role in education, the importance of which is often overlooked, is in the training of scientific personnel to staff the government agencies. This should not be identical with the training of scientists for basic research since, although the techniques may be to a great extent similar, the motives and objectives of the government scientist should be predominantly pragmatic rather than philosophical in order that the mission of the agency may be satisfactorily accomplished.

Clearly, in undertaking the graduate training of ocean engineers and government mission-oriented scientists it is also a vital function of the institutions to provide opportunities for engineering and applied or mission-directed graduate research in their laboratories.

In trying to foresee the future development of ocean resources and technology, we have no reliable basis for planning other than the examples set by the nuclear and the space field.

We realize that, initially, in developing a marine technology program, the emphasis will be upon applied science and engineering. The fraction of effort measured in dollars, devoted to basic research and teaching, should be a small but reasonable fraction of the total national budget devoted to oceanic programs. This fraction might be something of the order of 15 percent, if we can depend on previous examples at all. However, this is the most important fraction, particularly in the initial years, because the field can only grow in a sound and useful way if the skeleton cadres of trained oceanographers and ocean engineers are available at each stage of the development to supply the needs. By counter example we have the national nuclear effort that started shortly after the war. It was perhaps one of the most successful efforts of its kind. The staffing problem was, however, relatively easy. There were approximately 3,000 physicists available at the time and solid state research was just in its post-war beginnings. This meant that this relatively large pool of physicists was available for the developing science and industry. In addition, there was almost an order of magnitude greater number of chemists to add to the pool of trained manpower for helping

the planned development of the Atomic Energy Commission. When approximately ten years later the government again decided on a massive effort in space research and development, the corresponding pool of scientists was much larger. There were perhaps 15,000 physicists in the country at that time and a corresponding larger number of chemists whose talents were almost immediately adaptable to the needs of the new program.

The situation in oceanography, starting from today, 20 years later, is, from this viewpoint, much more critical. Not only is the pool of trained ocean scientists very much smaller, but the interdisciplinary nature of the field is far greater, ranging from molecular biology to physics to such fields as soil engineering, thus making the manpower stretch even further for the demands of this developing field. We should note in this connection that despite the relatively favorable situation of the space sciences and the nuclear sciences with respect to manpower, both agencies found it necessary to develop extensive fellowship programs to assure the flow of trained people to their fields.

When we combine both empirical facts, namely, the low fraction of the national effort one assigns to basic research and teaching and the very small initial pool of trained workers in the field, we conclude that very special efforts must be maintained to protect this part of the new program which is the key to the whole effort. The planners responsible for the overall program have a tendency to concentrate on the 85 percent part of the program, which tends to absorb a corresponding amount of their time and effort. However, they must be very careful to protect that remaining 15 percent and see that it grows carefully and steadily and that it is not subject to violent budgetary fluctuations simply because it is only a small part of the whole. Otherwise, the entire program can be endangered by frustrations and lack of accomplishment. We note in this connection that the AEC has very carefully over the years developed long-range plans in each of the categories that is important for a healthy complex. They have long-range plans for weapons development, for material procurement, for building construction, and for applied research, but also for the basic research; and its teaching and operating budget. We feel it important in oceanography that similar long-range budgeting procedures be adopted. Because of the much smaller initial pool of trained manpower, we believe it may be necessary to pay special attention to existing programs in basic research and teaching in order to reach an important national program in reasonable time.

Finally, it cannot be too strongly restated that, at the base of the chain of efforts leading from new discoveries in science to the development of marine resources and technology is the academic institution. The oceanographic institutions which have pioneered in this field must continue to provide this base, in an effective manner. They must be supported by an adequate and stable portion of the total funding if they are to do so.

4. Relationships With Mission-Oriented Government Agencies

Since the primary source of scientists and engineers in the government agencies and the universities is the academic graduate institution, these institutions have an obligation to train such persons in such a way as to fit reasonably well into the objectives of those agencies. Because the roles of basic and applied scientists are divergent, both as to scientific discipline and to motivation, this implies that the institutions should recognize the need, not only for scientific specializations within oceanography, but also for specialization in motivation. It is for this reason, for instance, that some of the institutions have developed fishery departments in which the student is not only taught science, but also accustomed to apply it as part of the mission of predicting, developing and conserving the fishery resources.

In spite of the above, it is unfortunately true that a high proportion of personnel in the government agencies is derived from scientists who are non-pragmatic or philosophically oriented in their training. Many, in fact, do not even have specialized training in oceanography. We recognize that excellent applied scientists may sometimes develop from those trained in a more philosophical atmosphere, as a result of agency in-house training. It is also true that many outstanding oceanographers received their graduate training in one of the basic disciplines rather than in oceanography itself, becoming familiar with the ocean later. Nevertheless we believe that the main corps of applied ocean scientists for mission-oriented agencies should be specially trained in the ocean sciences, and from a pragmatic viewpoint, and that this is a special role of the academic oceanographic institutes.

An important part of the process of training scientists adapted by scientific skills and outlook to the missions of the government agencies is the gaining of experience in the type of work peculiar to those agencies. For this reason it is extremely desirable that the agencies cooperate with the institutions in setting up appropriate research investigations, which may, at the same time, provide the student with valuable experience and also assist the agency in its mission. There are some excellent examples of such cooperation, but, in general, we believe that the institutions have paid insufficient attention to the need for scientists with a pragmatic approach, while the agencies have not been able to contract out sufficient work to provide the necessary training. A closer liaison is obviously called for.

It is not our suggestion that academic institutions become heavily involved in applied research. It is important that a proper balance be kept between the institutions' basic and applied programs. Nevertheless it must be kept in mind that the source of applied oceanographic competence of the government agencies lies within the private institutions and universities, and this resource must be put to its optimum use by appropriate training in research.

5. *The Funding of Fundamental Research (See Appendix I)*

The very considerable increases in the Federal budgets for "oceanography" and marine activities over the past years has been viewed with gratification by the pioneer oceanographic institutions, which for so long operated with little Federal support or interest. In fact, this has led to a burgeoning of new marine laboratories throughout the country. Yet the Council notes with grave concern that an apparent tenfold total increase in the Federal oceanography budget over eight years is partially the result of including items previously omitted. Also, it has been allocated in an inconsistent and irrational manner. The university laboratories, long the predominant source of basic oceanographic research and the domicile of the majority of the scientists investigating fundamental questions about the oceans, have been assigned a disproportionately small share of the increase.

We agree that, in order to speed up technological development, the percentage of the national budget apportioned to other activities in government and industry should have increased initially at a somewhat greater rate than that apportioned to the academic institutions. However, we are of the opinion that the fraction of the Federal budget spent in support of basic research at the academic institutions has become dangerously small. Typically, the operating expenditures of COLD institutions and university laboratories have increased about fourfold during the eight years of recent expansion in which the Federal budget has increased about tenfold. The budgets in some of the larger private laboratories have been almost constant during the last five years, during which time costs have risen. Some of the institutions are, in fact, beginning to experience serious financial difficulties for this reason, among others.

The actual funds available to universities are much less than the published figures suggest. Between 1963 and 1967, the total expenditures for the National Oceanographic Program reportedly increased from \$155- to \$312-million. However, the amount spent on basic research in academic institutions and government laboratories increased from \$21.5- to only \$27.5-million. The ratio of basic research expenditures to the total thus dropped from 13.7 percent to 8.8 percent during this period. (These do not include ship operating costs.) It is believed that the ratio of basic research support in academic institutions to that in government institutions and agencies also has decreased, thus further diminishing the ratio of support of academic institutions to the total funding. It is also believed that some applied research and even engineering research and development has been included in the figures for basic research.

The Council is extremely uneasy at this neglect of basic research and its implications for the future of the development of marine resources. It is patently too early, if there is ever a time, to throttle down on research with the thought that the national program should now devote all its resources towards converting knowledge into products. Further, if such growth of basic research as has been permitted is channeled mostly towards the government laboratories, then the personnel demands of the latter will grow as the ability of the former to supply them will decrease. The Council believes with conviction that a vigorous and strong capability must be maintained in the academic laboratory systems. This is necessary both for their contributions to scientific knowledge and as an indispensable element in the education of future scientists.

Further factors which have decreased funds available to the established academic institutes are the proliferation of new marine laboratories; the emergence of oceanographic interests on the part of scientists who were previously content to engage in essentially non-marine problems; and the establishment of oceanographic departments in inland universities. While this factor was obviously stimulated by the past increase of funds for oceanography and the consequent temptation for those, previously not interested, to divert their interest in this direction, the net result has been to dilute the available funds. The development of new institutes is not in itself harmful, when adequate additional funds are available both for new developments and also for maintaining the pioneer institutes at a stable financial level. A national policy is recommended which recognizes that the encouragement of newcomers to a field must be tied to adequate increase in funds. In the absence of such funds, a policy which gives priority to helping the newcomers can be harmful to the long established institutes, which have provided the backbone of oceanography over the past 20 to 50 years.

Among other factors which have conspired to make funding of the established institutes erratic and difficult to live with is the fact that there is a well defined tendency on the part of government agencies to carry out in-house a disproportionate amount of basic research, with only marginal relation to their missions. This has on certain occasions resulted in competition with the institutions. Otherwise acceptable proposals to NSF have been turned down on the grounds that a government agency is planning to do the work. A closer cooperation between the government agencies and the institutions could well help to correct this. The institutions must also shoulder the responsibility for not providing an adequate number of mission-oriented scientists to the agencies.

The private universities belonging to COLD have complained about the erratic financing due to NSF cost sharing rules. The objections specifically relate to the sudden increase in costs which is particularly difficult for private institutions to meet; the cumbersome methods for assessing the cost sharing; and the especial hardships whereby an institute with a large staff of scientists engaged purely in research is treated in exactly the same fashion as a small, non-oceanographic department in which the staff is primarily engaged in teaching.

Many oceanographic institutions are state institutions or quasi-state institutions with support from state funds. These are nevertheless affected adversely by the rules in general, but the few privately funded institutions face a very serious problem. The rules tend to remove them, at least partially, from the capability of participating in new grants from Federal sources. The matching funds required by the massive grants in oceanography cannot be met within existing funding. Private institutions are already fully extended in the struggle to match their rising costs, since they do not have the opportunity to seek state funds. State universities, too, have difficulty in obtaining increased state funds, even though they are qualified to request them.

The Bureau of the Budget has set the cost sharing policy for the funding agencies, and the agencies are obliged to administer it. However, we believe that a simpler system could carry out the policy without the inequities now existing.

The effect of the cost sharing policy is not the official across the board cost of 5 percent. The amount may reach in excess of 30 percent in some grants, and never less than 5 percent. One of the institutions reports that the present cost funding requirements may force it to give up as much as 60 percent of its grants, unless the rules are changed. Another has been obliged to curtail its traditional practice of giving professorial rank (Research Professor) to research personnel not engaged in teaching, since the title alone would bring about increased amount of cost sharing, according to the rules.

In general it may be said that cost sharing is especially hard on oceanographic institutions, that it adversely affects some state universities, and that it is invariably an increased and almost insurmountable burden to private institutions, whose only recourse is to seek new private sources.

Another complaint put forward by the same institutions relates to the manner in which proposals for certain types of biological oceanography are in direct competition with non-oceanographic biology proposals. This creates an unfair competition, since the higher cost of oceanographic operations tend to predispose review panels in favor of the non-oceanographic project. Furthermore, it has been said that the panels are often composed predominantly of persons neither ex-

perienced in, nor sympathetic to oceanography. Incidentally, this also leaves the possibility that funds originally intended for oceanography may be granted to projects of a biomedical or biological nature which are not essentially oceanography and for which other funds exist. Thus it is believed that the published budget for biological oceanography may give an inflated impression of the amount actually devoted to it.

A disturbing lack of consistency also exists between the earth sciences and biology programs of some agencies. In particular the earth sciences program will fund the costs of senior investigators in full, whereas the biological programs refuse to support more than a certain percentage. This, incidentally, is in addition to the regular cost sharing.

It is recommended that, in the agencies where this confusion exists, a biological oceanography program be set up separately from biology, or else that it be merged with earth sciences oceanography, where the confusion does not exist.

6. *The Funding of Mission-Oriented Research*

Mention has been made of the desirability of closer cooperation between Federal mission-oriented agencies and the institutions. It has also been pointed out that there is an impelling reason for the institutions to provide facilities for their graduate students to engage in the type of research appropriate to the agencies. Since no funds are available for this type of work in the funding agencies, it is impossible to provide adequate graduate research unless the mission-oriented agencies support a reasonable amount of such work at the institutions. This, in fact, has been carried out to a limited extent by some of the agencies, such as BCF and ONR, who are aware of the need for it. Nevertheless the agencies themselves face certain difficulties in developing a stable program of this nature.

Agencies having both contract and in-house research programs must naturally give priority to their own programs in times of budget tightening. This often presents great difficulty to the academic community, which may face sudden and complete cut-backs in agency funding. To avoid this, it is recommended that contract research programs in mission-oriented agencies be handled by a group completely separate from the in-house part of the agency. This separate group should have its own funding which is not available to the agencies' in-house program. This is similar to the highly successful pattern that has been used by the Navy Department with the Office of Naval Research. It is also clearly desirable that a closer coordination and liaison be effected between the institutions and the mission-oriented agencies.

7. *The Funding of Engineering Research*

In order to fulfill their important role as the primary sources of oceanographic engineers, academic institutions involved have supplemented their conventional engineering curricula with courses designed to give an understanding of the special problems of the ocean environment, such as wave and current stress, corrosion and hydrodynamics. In order to do this effectively, the graduate student must be provided with research experience in the field.

The two sources from which this student research can be funded are industry and the government. The industrial organizations are well aware of the need for specialized training in ocean engineering. Unfortunately, rather than contract with the institutions for research and development projects of modest size, suitable for engineering students, the tendency is for industry to provide its engineers with the experience they lack by in-house efforts.

The government mission-oriented agencies may be in a better position to provide this type of research by contract. There appears to be little or no provision for this type of support among the granting agencies and this deficiency should be corrected, since industry has not responded to the institutions to any appreciable degree.

The attention of the President's Council is drawn to this problem, which may well become a principal bottleneck in the development of marine resources and technology. Obviously, whatever solution is found, a higher degree of coordination between the institutions and industry is desirable.

8. *Long-Term and Block Funding*

One of the greatest problems of operating the institutions and one which causes serious financial losses and imposes excessive demands upon the top level scientific personnel, is the erratic manner in which funding is carried out. Some of

these problems have appeared in previous sections of this report, and others will be found in subsequent sections dealing with ship operation and sea grant college funding. Excessive time and work is needed to justify and re-justify proposals, planning cannot be carried out from one year to the next, and scientists spend an increasing amount of time on administrative problems caused by these matters. For logistical reasons the problems are far greater in oceanographic institutions than in the typical university teaching department. Two solutions present themselves and should be given serious consideration. They are long-term and block funding. It is true to say that, if offered a choice between a large increase in funds under present uncertain conditions, or a much smaller increase with stable funding, with lesser burdens of negotiation and justification, and with opportunity to plan for the future with assurance, then we should unhesitatingly choose the latter.

Under the institutional block funding concept, an institution (or its director) is awarded a grant or contract on the basis of a rather general proposal. Institutional block funding is generally justified more on the basis of the capabilities of the institution and its staff than on the specific merits of the proposed research. It can operate to permit exploratory research that would be difficult or impossible to propose in advance, and has, historically, permitted a healthy growth of the laboratories and resulted in rich scientific achievements. Continued funding of essential support functions can automatically be cared for by this means.

NSF has, happily, recognized the similar problems involved in ship operations and has responded to them by adopting block funding. It is desirable that this concept be extended so as to cover other areas, such as shop services, drafting, secretarial and editorial work, etc., the financing of which, on a continuous, stable basis, is essential if a qualified professional staff is to be maintained.

It is neither expected nor proposed that an unduly high proportion of oceanographic research should be financed on an institutional or block funding basis. Individual scientists should still retain complete academic freedom to propose, pursue, and control individual projects.

The current trend to require detailed project justification by the Federal agencies may eliminate or at least endanger an important and greatly needed type of research in marine science. Programmatic research involving a team approach cannot be easily funded in today's market in Washington, so that an attack on the most complex fundamental problems in understanding the oceans is rapidly being eliminated. The extraordinary complexity of the oceans dictates complex, interdisciplinary, long-term programs that require stable, guaranteed funding over correspondingly long terms. Some examples of this approach are the International Indian Ocean Expedition, cooperative studies of the equatorial regions in the Atlantic, the proposed Caribbean Sea Project, and Arctic oceanography in general. These programs may frequently require interinstitutional or international cooperation, multiship operations and an interdisciplinary approach, and always require long-term funding. In addition, they always require long-range planning, the assignment of supervisory and coordinating personnel who can look forward to some stability, and long range provision for the analysis of samples and data. The planning and funding must provide for the collation and analysis of results. The scientific publications resulting from such large complex projects should include interpretative studies as well as the publication of data. All of these call for long-term commitments of funds at the outset of the program.

9. The Sea Grant College Program

Until this program has been more clearly defined in actual operation it is difficult to assess the effect it will have upon the development of marine resources and its impact upon the academic institutions.

Inasmuch as the program is directed towards pragmatic objectives, it may provide much needed support for this particular role of the institutions, as well as a direct source of technical aid to segments of industry. Financial support for training and research in this area is not readily available from other sources except to a very modest degree.

The institutions foresee certain difficulties in participating in the program as it is now organized. These have to do with the specific prohibition of the use of Sea Grant funds for construction, charter, or maintenance of vessels or the acquisition of land and buildings. The institutions, already hard pressed to find funds to meet the requirements of cost sharing provisions in basic research grants, must now seek additional funds from private sources, already committed to

meet continuing commitments, or else from state legislatures. The latter, in the case of several of our member institutions, are not disposed to add further to their tax burdens and have even, in fact, cut back similar expenditures.

A similar problem arises in connection with the 33 $\frac{1}{3}$ percent cost sharing requirement. The provision that the value of existing, non-federally financed buildings may be used for this purpose provides only a temporary solution.

The general problems of funding research are compounded by the fact that addition of funds to NSF for the Sea Grant program has been offset by a reduction of funds elsewhere in the NSF budget. The net result of this procedure may be a change of emphasis towards mission-oriented activities, at the expense of basic research, support for which we believe already to be disproportionately low.

10. Regional Fleet Operation

The institutions have been concerned by proposals for the operation of regional research fleets, instead of institutional vessels. It is generally agreed that such operations cannot supply the needs of institutional programs of a continuing nature, although it is agreed, with reservations, that they may serve the occasional individual who does not choose to seek employment at an oceanographic laboratory.

The work at sea varies from one institute to another and the research vessels inevitably reflect this in a variety of design and equipment. For an institute that operates one or more research vessels on a full time basis, it is clearly desirable that these vessels be completely under the control of the institute. It has also been noted that efficient teamwork at sea is only possible when the same ship's crew and scientific party are accustomed to work together.

Furthermore, it has been found necessary to plan far ahead to schedule the allocation of a ship's time between several groups of scientists within an institute, in close cooperation with the marine superintendent and with due attention to necessary maintenance schedules. This is difficult to do even when all persons involved are located within one institute. To do this on a regional basis would be unduly cumbersome.

In short, it is the consensus that regional fleet operation would in no way benefit the seagoing oceanographic institutions or the government but would be obstructive to their work. A detailed statement on this has already been presented.

11. Research Vessel Operation Funding

A severe shortage of funds for ship operation could, unless corrected, result in the laying up of some research vessels and, in some cases, could result in the virtual cessation of seagoing activities on the part of major institutions. This is the most critical problem today, but there are other factors concerned with ship operation that would continue to place obstacles in the way of efficient operation, even if adequate funds were available.

If the oceanographic fleet is to be operated continuously, it is a waste of time to require top ranking scientists annually to prepare extensive and detailed proposals for that operation. The funding of the research fleet and auxiliary shore-side facilities on an ad hoc basis should be replaced by long-term coordinated block funding that would greatly increase the cost effectiveness of both scientists and research facilities. More simply put, when the federal government provides an oceanographic research vessel, it should be prepared to guarantee operating funds for that vessel.

Until recent years the funding of ship operations was arranged on a piecemeal basis. Under this arrangement, the total cost of a ship's operation was divided proportionately among the projects to be assigned to her. It was then necessary to negotiate ship funding separately for each individual project in order to reach the required total.

A great step forward was made on the initiative of NSF when the concept of block funding was advanced. In this case the funding of ship operations was to be essentially by means of a single proposal. However, in practice there are still a number of difficulties.

One of the time-consuming and burdensome requirements is that of scientific justification. In submitting a proposal for ship funds it is still required that each project to be assigned to the ship be described and be subjected to approval by a panel. Since most of these projects have already been appraised by agency panels for their scientific merit in applying for non-ship support costs, this is a

duplication of effort. There is ample precedent for dispensing with this, in the case of at least two ships funded by government agencies. These ships are for the use of individuals who for the most part are not located at oceanographic institutions. The funding for this operation is provided without the elaborate advance justification required of the seagoing institutes, and is for the use of individuals who do not, in general, have the seagoing training and experience of personnel from such institutes. It seems logical to suppose that the full time established oceanographic institutions should be given treatment at least as flexible as that accorded to such individuals.

A further problem arises when ship operations are funded by, not one, but two or more agencies. In this case it is necessary to secure prior agreement between the agencies as to their respective shares of the cost, an agreement that is not always easy to reach.

At present the institutions in general do not have specific provision for providing ship time for the training of graduate students. This problem is partially resolved by taking the students to sea as members of an experienced scientific party, using ship time allocated to a funded project. It would be desirable if, as in the case of EASTWIND and TE VEGA, the long established seagoing institutions could be allowed to justify part of their ship operations for specific training cruises.

12. Ship Replacements and Additions

Although the research fleet presently operated by the oceanographic institutions is superior to that prior to the last decade, the situation has become marginal and in some cases critical. Thus far the institutions have had little formal input into governmental plans for replacement schedules or for new vessels. The continuous modification of ship construction schedules, and re-assignment of research vessels, has prevented institutions from developing and maintaining long term ship plans.

The adequacy of the research fleet to perform the present program of research varies from institution to institution. In general it may be said that the fleet is inadequate for the program. In some institutions, however, the existing research vessels are insufficient to accomplish more than 50 percent of the planned operations and are reaching the limit of their economically operated life.

In addition to the shortage in numbers, much of the fleet is composed of converted freight vessels not specifically designed for research purposes. Some of these were only partially converted, on the assumption that they would only be in use for a comparatively short period before replacement by new vessels. This has further reduced the capability of the fleet, due to the increasing frequency of maintenance shutdown.

The present situation has been brought about by changes in scheduling the new vessel program, including delays and re-assignments. The need for new vessels a decade ago was in large part occasioned by expansion of oceanography as well as by need to replace older vessels. Today the need for replacement of older vessels has, in some cases, reached a state of emergency as these conversions become increasingly older and costlier to keep in operation and demand increasing time for yard maintenance. In contrast, some government agencies have ships to spare and are offering use of their ships to individual scientists. Design and operation problems are such that this does little to solve our problem. The institutions urgently need new vessels today primarily to correct serious replacement requirements and to bring the fleet up to a reasonable operating strength, without any consideration of future growth in research. But it is also necessary to plan ahead for growth in research, no matter how modest this may be. Since there is a considerable lag between government approval and the stages of design, building and acceptance, it is considered necessary to plan at least five years ahead.

The government has not fully considered the needs of the institutions in planning new shipbuilding programs. This may be partly due to failure of the institutions to provide a comprehensive estimate of requirement. It is also due to lack of a strong central coordinating agency. In order to assist in future planning, COLD is preparing a preliminary list of ship requirements and will refine and update this from time to time for the information of the government and appropriate agencies. This indicates that, over the next 5 or 6 years there will be requirements for 11 ships to replace existing ones and an additional 9 new

ones, at a total cost of about \$90 million. This is admittedly an optimal estimate, but our survey indicates that immediate requirements, without allowing for any extension of existing programs, call for at least 8 replacements and new vessels.

13. Shore Facilities

As in other problems there exists a considerable diversity among the institutes as to the adequacy of shore laboratory facilities. It can be generally stated, however, that these facilities are minimal for present needs and that some of the institutions are essentially in a state of emergency. In one institute, for instance, a group of 135 scientists and assistants is occupying useful space equivalent to about 100 square feet per person (exclusive of passageways, etc.). This is less than half of the minimum requirement for efficient operation.

In most cases there is an especially difficult situation due to the increase in number of graduate students over the past few years. In all cases it appears that the student capacity is now limited primarily by lack of space.

One of the causes of failure to keep pace with staff and student requirements may be the competition for funds with newer institutions. It is desirable that existing inadequacies in the older institutions be corrected before funds are committed to establish new organizations. Correction of these deficiencies will not provide for an expanded research program nor will it make it possible to increase greatly the number of students enrolled. Above and beyond present needs, provision should be made for development at a minimum rate of perhaps 5 percent per annum.

In order that the funding agencies may plan ahead and in order that the institutions may correct these deficiencies by orderly progression, COLD has drawn up a preliminary list of shore facilities that may reasonably be needed during the next five years. This indicates that in order to make shore facilities adequate for the existing staff and programs, it would be necessary to seek \$16.9 million from federal agencies during 1968 and 1969. Over a 5-year period, with a modest rate of expansion, the total sum sought would be \$45 million.

14. Oceanographic Manpower and Training (See Appendix II)

Pending the completion of the NSF Oceanographic Manpower Survey, adequate figures are not available for the growth in numbers of trained marine scientists and engineers.

It is probable that the universities are now training a nearly sufficient number of graduates in basic oceanographic science to meet present demands at the lower levels of experience. There is still, however, a serious shortage of more mature scientists capable of exercising leadership and there are clearly not enough of these people to fill the top ranks in any new institutions. For this reason the burden of training must still fall upon the existing institutions. These are unfortunately handicapped by overcrowded student facilities and have in almost all cases reached a point of student oversaturation. This shortage of older and experienced men may become less acute as the present corp of graduates acquire experience.

It is unlikely that the present rate of training, with 800 graduate students (including engineers) in residence at COLD institutions and a potential annual output of somewhat over 100, will be sufficient to take care of possibly expanded requirements in 5 years time. However, with no certainty about future funding, and therefore of the degree to which oceanography will grow, it is impossible to set a figure to the desirable increase in enrollment. It can be stated with certainty, however, that any increase will be impossible, unless the present facilities are brought up to an adequate level.

As pointed out in Section 6, there is a shortage of scientists trained to cope with the objectives of mission-oriented agencies. This has resulted in many students leaving school before completing graduate work in order to secure well paid positions in the government agencies. There is a very evident need to encourage the training of more students in such fields as fisheries and the environmental applied sciences.

Perhaps the most obvious shortage of training is in ocean engineering. Most engineering industries are attempting to ocean-orient the engineers in their employ on an in-house basis. All of the graduates of the few ocean engineering schools are being absorbed and there are not only vacant positions in industry, but many other positions are filled by competent engineers without ocean engineering experience.

On an average, the institutions today are unable to accept more than 15 percent of qualified applicants. The remedy for this situation at the present time does not appear to be the organization of new institutes, since the mature and experienced personnel needed to teach are in very short supply. Rather the existing institutions should be provided with the necessary support to bring their present facilities up to an optimum level, including both shore and ship requirements. Especially is it necessary to provide ship time for student training at the established institutions.

APPENDIX I

NOTES ON THE FUNDING OF FUNDAMENTAL RESEARCH

It is extremely difficult to identify the allocation of funding for oceanographic research. This is due, primarily, to the fact that, although the Federal Government puts out a considerable volume of statistics yearly, it is unfortunately true that these are rarely broken down under the headings one desires. This is certainly true of the funding of oceanographic research, which has been tucked away as part of other budgets for many many years. Further, since attempts were begun to break out oceanographic statistics as such, the ground rules were changed quite often, in small areas, and were changed radically on at least three occasions. The first occasion was ICO's extension, in fiscal year 1967, of their definition of the oceanographic budget to "include major components of oceanographic engineering in MOHOLE and DSSP programs among others." The second was the interpretation of the oceanographic budget made by the Panel on Oceanography of the President's Science Advisory Committee, also in 1967. The third occurred with the action of the President's Council in adding "certain classified naval programs; ship and vehicle research; additional technological developments related to such subjects as fish, marine minerals, and energy resources; and sea shore land use and recreation." These, of course, in large measure form no part whatsoever of previous years' budgets or expenditure data. It is understandable, then, that it is most difficult to be able to draw, and to justify, conclusions concerning oceanographic research expenditures over the past years.

There are, then, at least three basic budgets with which we are dealing. These are the so-called "Total Federal Oceanography" budget; the "National Oceanographic Program" of ICO; and the one with which we are primarily concerned, the "Oceanographic Research" budget. Even this latter can be broken down into two parts, the budget for basic research in institutions, and one concerned with basic research in Federal laboratories and elsewhere.

Data concerning basic research in oceanography are impossible to separate from statistics prior to 1963; in the five-year period ending 1967, however, basic research expenditures increased by a factor of 1.3 times, while during that same period total oceanographic expenditures were increasing 2.0 times. It can be stated without any hesitation, then, that total support is rising at a rate disproportionate to that of the increase in expenditures for basic research. The total support figure is thus increasing at a rate almost twice that the support of basic research.

It is demonstrable, however, that, speaking strictly in terms of obligations for basic research of all kinds, the proportion of obligations assigned to educational institutions, as such, as compared with total federal obligations for basic research, has been declining steadily. In 1963, obligation for basic research awarded to educational institutions as such was 33.5% of all obligations for basic research; in 1964 the figure had decreased to 32.6%; in 1965, the figure had decreased to 32.2%. In 1965, intramural obligations accounted for 19.2% of the total obligations; 20.9% went to profit-making research organizations; 5.4% went to "other non-profit organizations"; and 15.6% went to research centers administered by educational institutions.

Reference to Table II of the COLD presentation will indicate that that percentage of the federal oceanography expenditures devoted to basic research has decreased from 13.7% in 1963 to 8.8% in 1967.

The following quotation from the PSACPOO report (pages 68-69) is pertinent. "Applied research and development have grown more rapidly than basic research, and it appears that technology in industrial components supported by the Federal Government is growing most rapidly of all."

The Council's "Marine Science Affairs" states: "General purpose research (which must be supported as a national policy to maintain an innovated capa-

bility adequate to meet both present and future national needs) includes a substantial academic research component. This is of special importance and has received Council study to be sure that its growth is consistent with both needs for additional knowledge and a new opportunity for research associated with increasing graduate student interest in ocean-oriented programs."

In 1958, there were 19 small university oceanographic laboratories; and six large institutions (with budgets larger than \$450,000). In 1963 their number had increased to eight large (the dividing point being a budget larger than \$800,000) and 29 small laboratories. In the same period of time, government laboratories increased from 35 to 43. Thus, private laboratories increased by 37%, with government laboratories increasing by 22.8%. The ICO "Program" for fiscal year 1967 has the following to say about the growth of institutions supported by NSF: "... the major growth in the support has been since fiscal year 1958; that year NSF made approximately 80 grants at 38 universities and scientific institutions. Today (1967), the Foundation sponsors well over 350 programs at 124 universities and institutions engaged in the study of the oceans and the Great Lakes." This means, of course, an increase in the number of grants by 338% and in the number of institutions supported in oceanography by 226% in the past ten years.

The growing position of the profit-making research organizations should be noted. Their share of the federal obligations for basic research has grown from 15.5% in 1963 to 20.9% in 1965. This share probably has increased disproportionately in 1966-1967, in view of the emphasis being placed on the role of industry.

TABLE I.—COMPARISON OF TOTAL FEDERAL OCEANOGRAPHY; NATIONAL OCEANOGRAPHIC PROGRAM; AND BASIC RESEARCH EXPENDITURES, FISCAL YEARS 1963-67

EXPENDITURES (In millions of dollars)						
Year	Total Federal oceanography	Average percent yearly increase	National oceanographic program	Average percent yearly increase	Basic research	Average percent yearly increase
1963.....	\$155	-----	\$31	-----	\$21.2	-----
1964.....	188	-----	42	-----	23.9	-----
1965.....	248	-----	46	-----	26.1	-----
1966.....	244	-----	51	-----	24.6	-----
1967.....	312	-----	55	-----	27.5	-----
Total.....	1,147	² 101.3	³ 225	² 77.4	³ 123.3	² 29.7

¹ Estimated.

² $\frac{1967-63}{1963} \times 100$.

³ Ship operating costs excluded.

Source: PSACPOO; ICO national oceanographic program, fiscal year 1965.

TABLE II.—NATIONAL OCEANOGRAPHIC PROGRAM AND BASIC RESEARCH EXPENDITURES AS PERCENTAGES OF TOTAL FEDERAL OCEANOGRAPHY EXPENDITURES, FISCAL YEAR 1963-67

PERCENT OF FEDERAL OCEANOGRAPHY EXPENDITURES		
Year	National oceanographic program ¹	Basic research
1963.....	20.0	13.7
1964.....	22.3	12.7
1965.....	18.5	10.5
1966.....	20.9	10.1
1967.....	17.5	8.8
Total.....	19.6	10.7

¹ Ship-operating costs excluded.

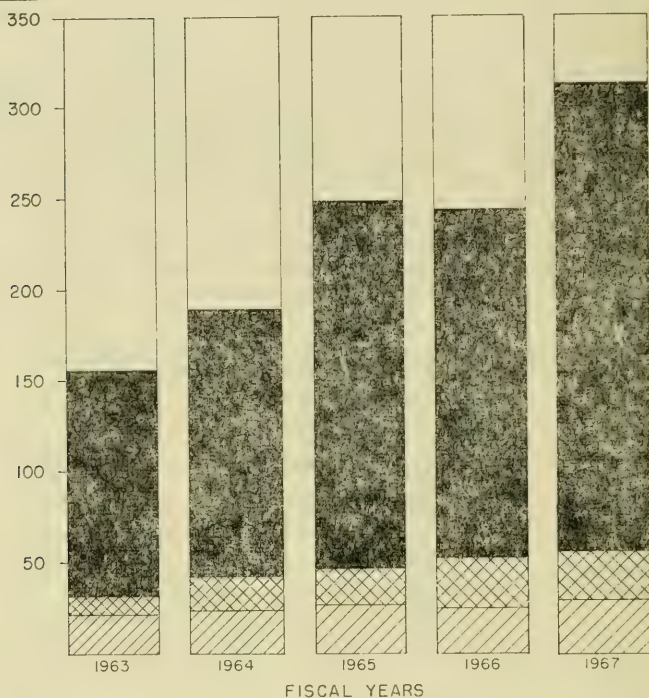
Source: COLD table I.

COUNCIL OF OCEANOGRAPHIC LABORATORY DIRECTORS

FIGURE 1

"TOTAL NATIONAL OCEANOGRAPHIC PROGRAM", "N.O.P. RESEARCH",
AND "OCEANOGRAPHIC BASIC RESEARCH" EXPENDITURES
(IN MILLIONS OF DOLLARS)

EXPENDITURES



SOURCE: PSACP00, "EFFECTIVE USE OF THE SEA", p. 63

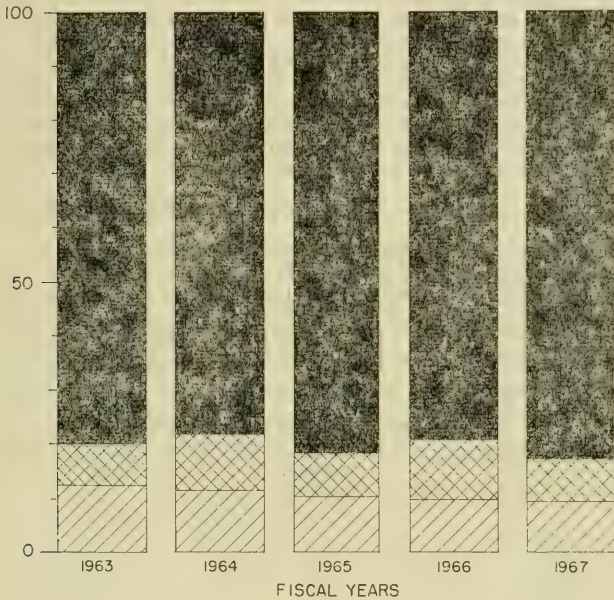
TOTAL N.O.P. EXPENDITURES	■
N.O.P. RESEARCH	▨
BASIC RESEARCH	▧

COUNCIL OF OCEANOGRAPHIC LABORATORY DIRECTORS




FIGURE 2

"NATIONAL OCEANOGRAPHIC PROGRAM RESEARCH" AND "OCEANOGRAPHIC BASIC RESEARCH"
EXPENDITURES AS PERCENTAGES OF "TOTAL NATIONAL OCEANOGRAPHIC PROGRAM" EXPENDITURES

% OF TOTAL
EXPENDITURE



SOURCE: COLD TABLE II

TOTAL N.O.P. EXPENDITURES 
N.O.P. RESEARCH 
BASIC RESEARCH 

APPENDIX II

NOTES ON MANPOWER AND TRAINING

The following quotation from the PSACPOO report is pertinent.

"... the Navy has been a major consumer of the output of academic oceanography in both manpower and science. Without increased numbers of scientists and engineers knowledgeable about oceans the Navy cannot carry out many of the programs reviewed above. Likewise, without the generalizations produced by academic research the Navy cannot efficiently utilize information collected to support these programs.

"For these reasons the Panel *strongly recommends* that the Navy continue its support of academic research in education related to oceans... the Navy's budget for oceanography has almost doubled in the fiscal year 1965-67 period. The Navy's contribution to academic oceanography in the area of basic research during the period has remained constant... It is important that the Navy maintain a proportionality between the support of academic research in education and its total oceanographic program. This would imply a marked increase in support of academic oceanography if the proportionality prior to 1965 is to be maintained as the whole Navy program expands. We suggest, in addition, that the ONR might profitably re-examine the particular importance of ocean science and technology to the Navy's basic mission."

TABLE III.—*Student and Degree Statistics, COLD institutions, Fall Semester, 1967*

Student applications received for fall term, 1967.....	1,884
Students being accepted for fall term, 1967.....	286
Total of graduate students enrolled, fall term, 1967.....	818
Degrees granted, academic year 1966-1967:	
Master of science (in oceanographic sciences only).....	99
Doctor of philosophy (oceanography only).....	60

Source: COLD Survey, 1967.

OCEANOGRAPHIC DEGREES GRANTED, 1960-65

Academic year ending—	Full-time enrollment	Degrees granted	
		M.S.	Ph. D.
1960.....	92	9	6
1961.....	105	14	9
1962.....	126	22	12
1963.....	188	22	8
1964.....	¹ 0	41	9
1965.....	² 520	35	25
1966.....	² 800	³ 0	¹ 0
1967.....	² 980	³ 99	³ 30

¹ Not available.

² Estimated.

³ Minimum (see above).

Sources: ICO national oceanographic program, fiscal year 1966; ICO national oceanographic program, fiscal year 1967; and Marine Science Affairs, 1967.

APPENDIX 9

STATEMENT OF AMBASSADOR ARVID PARDO, REPRESENTATIVE OF MALTA, IN COMMITTEE I, ON THE QUESTION OF THE RESERVATION EXCLUSIVELY FOR THE PEACEFUL PURPOSES OF THE SEABED AND THE OCEAN FLOOR, NOVEMBER 1, 1967.¹

May I first of all, Mr. Chairman, express my deep appreciation to you for permitting me to introduce at such an early date the item submitted by my delegation entitled "Examination of the question of the reservation exclusively for peaceful purposes of the sea-bed and the ocean floor, and the sub-soil thereof, underlying the high seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind".

I understand that the fact that Malta has raised the question of the sea-bed and of the ocean floor in the United Nations General Assembly has aroused some astonishment, if not suspicion, in the minds of some delegations, and even among legislators in some countries. A member of the House of Representatives of the United States recently expressed the feelings of many in the following words:

"The United States as a Member—and I might add a paying Member—of the United Nations is entitled to know: First, why did the Maltese Ambassador Arvid Pardo, make this premature proposal? Second, who put the Maltese Government up to the proposal? Are they perhaps the sounding board of the British? Third and most of all, why the rush?

"It is my conviction that there is no rush; it is my conviction that the presently agreed international law is reasonable and substantive. There is little reason to set up additional unknowns and additional legal barriers which will impair and deter investment and exploration in the depths of the sea even before capabilities and resources are developed." (*Congressional Record*, 28 September 1967, H12681)

We feel that we owe a brief explanation to those in this room who may share the sentiments so frankly expressed by the Congressman.

The Maltese islands are situated in the centre of the Mediterranean. We are naturally vitally interested in the sea which surrounds us and through which we live and breathe. We have been following closely for some time developments in the field of oceanography and deep sea capability and have been impressed by the potential benefits both to our country and to mankind if technological progress takes place in a peaceful atmosphere and within a just legal framework and, on the other hand, by the truly incalculable dangers for mankind as a whole were the sea-bed and ocean floor beyond present national jurisdiction to be progressively and competitively appropriated, exploited and used for military purposes by those who possess the required technology. Hence our request for United Nations consideration of the question. Our proposal was formulated entirely without the benefit of advice from other countries and I can categorically state that we are not a sounding board for any State and that nobody "put the Maltese Government up to it".

My Government decided to take action at this session of the General Assembly because rapidly developing technology makes possible the exploration, occupation and exploitation of the world's sea-beds and much of its ocean floor. We are convinced that in accordance with historical precedence this capability will lead, indeed is already leading, to appropriation for national use of these areas, with consequences for all our countries that may be incalculable. Appropriation for national use of the sea-beds and ocean floor underlying the seas beyond the limits of present national jurisdiction may be inevitable, but we believe that Governments might appreciate an opportunity to give careful consideration to the issues involved and to examine whether it might not be wise to establish some form of international jurisdiction and control over the sea-beds and ocean

¹ Source: UN General Assembly documents: Provisional A/C. 1/PV. 1515 and Provisional A/C. 1/PV. 1516 of November 1, 1967, English; provisional verbatim records of 1515th and 1516th meetings.

floor, underlying the seas beyond the limits of present national jurisdiction, before events take an irreversible course.

The dark oceans were the womb of life: from the protecting oceans life emerged. We still bear in our bodies—in our blood, in the salty bitterness of our tears—the marks of this remote past. Retracing the past, man, the present dominator of the emerged earth, is now returning to the ocean depths. His penetration of the deep could mark the beginning of the end for man, and indeed for life as we know it on this earth: it could also be a unique opportunity to lay solid foundations for a peaceful and increasingly prosperous future for all peoples.

The air is the atmosphere of our planet: the seas and the oceans are the atmosphere of the submerged land which constitutes more than five-sevenths of the area of this earth. The sea has been used as a means of communication in peace and war for thousands of years: its living resources, plants and fish have long been exploited; and around the use of the surface and upper layers of the seas a complex of international law has developed, but the depths of the oceans and the ocean floor were of little interest until little more than a hundred years ago when the question of laying a trans-Atlantic cable came to the fore. It was at that time that the first scientific deep-sea surveys were undertaken. Subsequently, the invention of the echo-sounder enabled scientists to obtain much more precise and detailed information on the shape of the bottom of the seas and oceans than had been possible by using the previous method of the weighted line. Ocean floor photography and deep submergence vessels with near-bottom capability now enable us to acquire an ever-increasing store of knowledge about the sea-beds and the abyss, although we must remember that vast areas still remain to be mapped.

It may be useful at this stage to give a general idea of the geophysical features, known resources of the ocean floor and present technological capability to exploit them.

The land underlying the seas and the oceans constitutes nearly three quarters of the land area of this earth. It is commonly divided into the continental shelf, the continental slope and the abyss.

The continental shelf can be defined as that area of the sea or ocean floor between the mean low water line and that sharp change in the inclination of the floor that marks the inner edge of the continental slope. The sharp change in inclination from about one-eighth of one degree to more than three degrees, occurs at varying depths, usually around the 130 to 150 metre contour line. The width of the shelf ranges from less than one mile to up to 800 miles. Continental shelves, frequently scarred by deep canyons, can be generally characterized as the geological continuation of adjacent land areas of which they are the submerged extension.

The continental slope, usually from ten to twenty miles wide, extends from the outer edge of the continental shelf to the abyss or ocean floor. The inclination of the slope varies widely from as little as three degrees to over forty-five degrees: slopes of twenty-five degrees are common.

The abyss or ocean floor appears to be a rolling plain from 3,300 to about 5,500 meters below the surface of the sea: it is scarred by deep gorges called trenches and studded with sea mounts and guyots. The mean depth of the superjacent waters is 3,800 metres. More than seventy-five per cent of the ocean floor lies at a depth of less than 5,000 metres.

Ocean basins are frequently separated by great submarine mountain ranges, a few of the peaks of which sometimes rise above the water. The greatest mountain ranges on earth are not on any continent, but in the sea. The Mid-Atlantic ridge extends the entire length of the Atlantic, spanning one-third of the circumference of the globe and frequently rising 3,500 metres above the ocean floor. The Mid-Oceanic ridge extensively mapped during the years 1959–1965 by the International Indian Ocean Expedition, organized by the International Council of Scientific Unions, curves in a great arc, in places 1,500 miles broad, from the Arabian peninsula to the Crozet Islands, rising occasionally to 5,000 metres above the abyss, yet even its highest peaks miss the surface.

The floors of the seas and oceans are covered by sediments: terrigenous comparatively near the coast, pelagic farther from shore. Pelagic sediments are called clays when they contain less than 30 per cent of organic remains, and oozes when they contain more than 30 per cent of these remains. The oozes in turn are divided into two main groups: calcareous oozes and siliceous oozes. Oozes and clays are the dominant sediments of the ocean floor; however, other

materials must also be mentioned; the most important of these are manganese nodules.

The beach and sea water resources of continental shelves have been exploited for hundreds, indeed many thousands, of years for the extraction of salt, sand, gravel and other useful products. The chemical composition of water has long been known. I remember learning in school, about forty years ago, that a cubic mile of sea water contained so many million tons of salt, of compounds of calcium, magnesium and potassium, so much bromine and so many tons of other minerals, including sixty-five tons of silver and twenty-five tons of gold. I had visions of discovering a successful method of extracting a portion of all this wealth, visions which apparently were shared by the German Government after the First World War when it outfitted a vessel, the *Meteor*, to investigate whether it was possible to find a cheap method of obtaining gold from sea water to pay war reparations. Unfortunately, it was found that the cost of extraction far exceeded the amount of gold recovered, and the *Meteor* returned with much scientific information but little gold.

An economic method of extracting gold and silver from sea water has not yet been found, but in-solution mining—that is, the process of recovering resources by extracting them from sea-water—is acquiring ever increasing importance in unexpected fields. I do not refer so much to the mining of salt, bromine, compounds of potassium, calcium, magnesium or iodine or to the possibilities of mining other minerals, as to the development of an advanced technology for the cheap extraction of fresh water from sea water which gives us the promise of making deserts bloom and the possibility of supplying the water needs of multiplying urban populations.

In contrast to in-solution mining, on-bottom mining—that is, the process of recovering resources lying on the ocean floor—is quite recent and may be said to date substantially from the end of the Second World War. It involves three stages: exploration, the mining operations themselves and transportation to markets. Photography and dredging have up to the present been the principal methods of undertaking exploration and have enabled us to obtain a good knowledge of the on-bottom mineral resources of large areas of the sea beds of the continental shelves of many countries. The recent construction of specialized submersibles will enable us to expand our knowledge more rapidly and conveniently. Principal on-bottom minerals mined at the present time on continental shelves, usually by means of bucket ladder, hydraulic or grab bucket dredges, include tin off Thailand, Indonesia and Malaysia, diamonds off South Africa, phosphorite off California, and so on.

Sunken treasures are among the more romantic things sought for in the shallow waters of continental shelves. Their economic value is sometimes considerable: within the last few months the treasure, worth an estimated \$3 million, carried by Admiral Shovell's fleet, was discovered near the Scilly Islands and the hulk of a Netherlands ship transporting some half million dollars worth of bullion was also discovered.

It may also be convenient to refer briefly at this stage to the archeological treasures lying on continental shelves and on the ocean floor. I have seen an apparently authoritative statement to the effect that there would appear to be more objects of archeological interest lying on the bottom of the Mediterranean than exist in the museums of Greece, Italy, France and Spain combined. There must be some basis for the statement since the French Government has constructed a submersible, the *Archeonaut*, specially designed for underseas archeological exploration. In addition, the *Archeonaut* will have the important scientific mission of systematically studying for the first time in history the submerged quaternary beaches and their prehistoric inhabitants.

Sub-bottom mining involves the recovery of minerals existing under the floor of the sea bed, and may involve either the exploitation of vein deposits or of minerals such as petroleum, gas and sulphur. Vein deposits, exploited by driving shafts and tunnels from adjoining land, are now mined, among other places, off Finland and Newfoundland for iron and near Japan, England and Canada for coal. In view of the limited extent of known undersea vein deposits of metallic ores and the inconvenience and comparatively high cost of their exploitation, they would not appear to possess much potential significance for world production. Quite the contrary is the case for petroleum, natural gas and, to a somewhat lesser extent, sulphur.

Although off-shore mining of petroleum dates from 1899, production did not become of real economic significance until after the Second World War. The rapid progress made both in evaluation and in the exploitation of offshore petro-

leum resources is illustrated by the following tentative and incomplete data: in 1947 petroleum reserves under the United States continental shelf were estimated at around 33 billion barrels and annual offshore production was about 25 million barrels, in 1965 known reserves were estimated at some 100 billion barrels and annual offshore production had grown to 240 million barrels which, however, was still only about 7.5 per cent of total United States petroleum production. In other parts of the world similar rises in annual offshore production and in known reserves have been recorded over the past twenty years. To give but one example, the *Komsomolskaya Pravda* of 16 August 1967 reported that enormously rich deposits of oil had been found on the arctic continental shelf of the Soviet Union at depths of twenty to twenty-five metres. The article stated:

"The Tyumen region alone promises by 1980—that is, in a dozen years—to yield as much oil as was produced in the entire Soviet Union last year (1966)".

Exploration of offshore petroleum resources is proceeding at an accelerated pace in nearly all parts of the world with drilling expenditure growing at a 14 per cent compound annual rate.

Even more spectacular progress has been made in the exploration and exploitation of offshore natural gas. In 1950 United States offshore natural gas reserves were estimated at 50 trillion cubic feet and in 1965 they were estimated at 150 trillion, in the six-year period 1960 to 1965 offshore gas production has more than doubled from 403 billion cubic feet to 977 billion cubic feet.

Exploration activity is continuing feverishly. We have all heard, for instance, of the enormous discoveries of natural gas under the North Sea. According to the *Oil and Gas Journal* of 27 February 1967 the Groningen field alone is reputed to contain 40 trillion cubic feet of natural gas, the Shell/Esso 49/26 field another 6 trillion, and several other blocks have reserves in the trillions.

Up to now I have been speaking exclusively of resources known to exist under the shallow waters of the continental shelf. I have tried to make the point that these resources are known to be valuable and that, at least in the case of petroleum and natural gas, systematic exploitation of presently known offshore resources is likely to be sufficient to cover by itself expected growth in demand.

The continental shelf, as we have defined it, however, constitutes less than 10 per cent of the sea-bed and ocean floor of the world. We must now examine whether the vast, mysterious submarine areas plunged in perpetual darkness that lie beyond the continental shelf contain valuable known resources and whether such resources may be commercially exploited on a large scale in the near future, and by the near future I mean within the next decade. In this connexion we shall not refer to the possibility of in-solution mining, which, although practicable, does not appear likely, but rather to the potential for on-bottom and sub-bottom mining.

Nearly a hundred years ago the "Challenger" expedition discovered the existence of phosphorite and manganese dioxide concretions on the ocean floor. The abundance of such concretions—commonly called nodules—was confirmed over the years by a number of oceanographic expeditions and their chemical composition was studied. Manganese nodules, in particular, have attracted attention and the extent of deposits and concentration of the nodules in various locations on the ocean floor have been ascertained with good approximation. Manganese nodules are irregularly spherical in shape, like potatoes, ranging from 0.5 to 25 cm. in diameter, and are commonly found on the surface of the ocean floor at a depth of between 1,500–6,000 metres. Concentration of the nodules on the ocean floor, their chemical composition and the extent of the deposits vary widely. It would appear that about 20 per cent of the surface of the Pacific Ocean floor is covered by nodules sometimes in the almost incredible concentration of 50 kg. per square metre: maximum known metal content of the main materials in the nodules has been determined as follows: 57.1 per cent manganese, 39.5 per cent iron, 2.1 per cent cobalt, 2.9 per cent copper, 2.4 per cent nickel and .5 per cent lead. I do not have world tonnage estimates of manganese nodules: tonnage estimates for manganese nodules lying on the surface of Pacific Ocean sediments are quoted by John L. Mero in his book *The Mineral Resources of the Sea* on page 175. They range from estimates made by Zenkevitch and Skornyakova of 0.9×10^{11} tons to estimates of 17×10^{11} tons. On the basis of those estimates Mr. Mero has attempted conservatively to calculate the reserves of metals in the manganese nodules of the Pacific Ocean: the results are astounding. The nodules contain 43 billion tons of aluminum equivalent to reserves for 20,000 years at the 1960 world rate of consumption as compared to known land reserves for 100 years; 358 billion tons of manganese equivalent to reserves for 400,000 years as

compared to known land reserves of only 100 years; 7.9 billion tons of copper equivalent to reserves for 6,000 years as compared to only 40 years for land; nearly one billion tons of zirconium equivalent to reserves for 100,000 years as compared to 100 years on land; 14.7 billion tons of nickel equivalent to reserves for 150,000 years as compared to 100 years on land; 5.2 billion tons of cobalt equivalent to reserves for 200,000 years as compared to land reserves for 40 years only; three-quarters of a billion tons of molybdenum equivalent to reserves for 30,000 years as compared to 500 years on land.

In addition, the Pacific Ocean nodules contain 207 billion tons of iron, nearly 10 billion tons of titanium, 25 billion tons of magnesium, 1.3 billion tons of lead, 800 million tons of vanadium, and so on. Manganese nodules, however, are found also in the Atlantic and Indian Oceans and thus estimates made must be very substantially increased to obtain world estimates.

The vastness of this untapped wealth is made even more incredible by the fact that manganese nodules are forming at a rate faster than 1960 world consumption of magnesium, manganese, cobalt, zirconium and other metals.

In his book Mr. Mero states that manganese nodules could be mined, transported to port and processed at a cost of some \$28.5 per ton, as compared to gross commercial value of recoverable metal content ranging from \$40 to \$100 per ton. Mr. Mero calculates that if the nodules are mined primarily to obtain nickel, which is at present the most significant metal, an operation designed to produce 100 per cent of United States consumption of nickel would also produce 300 percent of its annual consumption of manganese, 200 per cent of that of cobalt, 100 per cent of that of titanium, etc., and the deposits would be accumulating faster than they could be mined.

It is, I think, clear that unrestricted national exploitation of the manganese nodules of the ocean floor would set a ceiling to prices and curtail the markets of a side variety of mineral exports that are important for the economy of a number of countries, in the same way as the export markets for many materials of vegetal origin have been curtailed by the development of synthetic or substitute products.

But of course the valuable resources lying on the surface of the ocean floor are not limited to manganese nodules. There are the phosphorite nodules already being mined on the continental shelf. Very rich exploitable deposits of phosphorite nodules exist beyond the continental shelf which, Mr. Mero indicates, should give an annual return on investment of around 40 per cent after payment of all taxes.

The sediments of the ocean floor also contain an estimated 10^{16} tons of calcareous oozes accumulating at the rate of 1.5 billion tons per annum. If only 10 per cent of those deposits were mined for the manufacture of Portland cement, they would last for 10 million years, but they are accumulating eight times faster than the world limestone consumption in 1964. The siliceous oozes of the ocean floor are estimated to total 10^{13} tons and a product in excess of 99 per cent pure silica on a dry-weight basis is obtainable from them without much difficulty. Mero writes:

"The uses to which this type of ooze may be put are many. It could serve in many of the ways in which diatomaceous earth is now used, such as in light-weight aggregates for concrete, as a filter, in the manufacture of insulation bricks for both heat and sound, as a mineral filter, as an absorbent and as a mild abrasive." (*Op. Cit.* p. 117) Ocean-floor sediments also contain 10^{16} tons of pelagic clays which contain manganese grains in concentrations of up to 5 per cent and, in addition, philipsite, palagonite, copper, nickel, cobalt, vanadium, etc., and rare earths in varying concentrations.

Nor is the economic potential of the deep seas and ocean floor limited to the mining of minerals; possibilities of truly inestimable value can clearly be foreseen when these areas can be exploited as a present and future source of food. I do not refer only to the possibilities for further expansion of world fisheries or to a more intensive exploitation of the plant life of the oceans, but primarily to the vast potential for farming and fish husbandry. An author, Arthur Clarke, in his book *The Challenge of the Seas*, believes that "the time may come when only a few luxury products—fruits for example—will be grown on land and all else will come from the ocean." A United States business magazine, *Forbes* believes that farming of the oceans and on the ocean floor may become commercially profitable in the 1980's. Fish husbandry, utilizing techniques such as the use of dolphins as sheep-dogs, and air-bubble curtains to delimit and protect fish ranges are no longer science fiction; these, together

with other techniques, are clearly foreseen possibilities that may transform the entire world food picture in fifteen years' time. In the meantime, the first steps in the transformation of the ways in which the living resources of the sea are utilized have already been taken with the development by scientists of the United States Bureau of Commercial Fisheries of fish-protein concentrate (FPC) from less popular fish. A factory to produce fish-protein concentrate is being built. It is expected that ten grammes of this concentrate "will provide adequate animal protein to meet the daily requirements of one child at an estimated daily cost of less than one cent" in United States money.

Commercial ocean farming and fish husbandry, which I have mentioned in passing, lie in the future; national appropriation and the commercial exploitation of the mineral resources of the ocean floor, on the other hand are imminent. Leases have already been granted for the mining of phosphorite deposits lying well beyond the continental shelf, at depths exceeding 1,000 metres and at a distance of up to 50 miles from the nearest coast. A prototype submersible for commercial mining of the rich manganese-nodule deposits of the ocean floor at depths up to 4,000 metres is under construction now and other are planned. The nodules will be raked from the ocean floor and pumped into the vessel; from the submersible the nodules will be transferred easily to an accompanying cargo-ship by means of a floating conduit.

If the mineral resources lying on the ocean floor are incredibly vast, equally vast are the resources lying below the floor's surface.

We know little about the presence of vein deposits, yet they must in all likelihood exist, as their presence appears to be confirmed by a report which appeared on 7 August this year in *The New York Times*, to the effect that a rich concentration of gold, silver, zinc and copper ores had been found under the Red Sea at a depth of 7,000 feet. "A very conservative estimate puts the value of ores in this deposit alone at about \$1.5 billion" in United States money.

More is known about petroleum, gas and sulphur deposits. The resources appear to be phenomenal and estimates of reserves are constantly increasing as exploration proceeds. In 1947, Pratt estimated world petroleum reserves under the seas at 1,000 billion barrels; in 1966 these were estimated at 2.5 trillion barrels by Rear Admiral O.D. Waters, Jr.

Present off-shore commercial petroleum production is confined to the continental shelf at present in waters not exceeding 100 metres in depth and it still uses land technology. This situation cannot be expected long to continue. Semi-submersible drilling rigs in operation today are capable of drilling in water in depths up to 350 metres. The Mohole project, discontinued in 1966, also potently stimulated progress in the techniques of deep-ocean drilling, and a vessel was constructed capable of drilling to depths of 7,000 metres. Self-propelled, ocean-going oil-drilling rigs currently being advertised in technical journals can anchor in water 180 metres deep and drill 6,500 metres into the ocean floor. Remote-controlled robots for underwater use have been developed to maintain underwater well-heads. Methods of transportation to the coast of off-shore oil are also being improved. Oil is now carried by barge, but undersea pipelines already exist: it is probable that we shall see their extension beyond the continental shelf in the near future.

The forces that led to the national appropriation and intensifying exploitation of the continental shelf continue to gather strength. Exploitation of the continental shelf over the past twenty years was a gradual process; we must look to its intensification and to the rapid extension of national appropriation and exploitation far beyond the shelf in the next few years. There are various considerations that make such a development virtually certain.

Public and private expenditure on oceanographic research and technology is increasing very rapidly. In the United States governmental expenditures in these fields were only \$29 million ten years ago; they are now nearly \$500 million and are projected to exceed \$5 billion in ten years' time. Similar increases in governmental expenditures may be observed in the Soviet Union and France and no doubt also in other technological advance countries. Increases in public expenditure are paralleled by increases in private expenditure, particularly by the oil companies. Massive expenditure is likely to make possible far earlier break-throughs than are now foreseen in the technology still required to make intensive commercial exploitation of the ocean floor possible. As it is, remarkable advances in technology have been obtained with limited budgets in the last few years.

Seven years ago the deepest part of the ocean, the bottom of the Mariana Trench, was reached for the first time by a self-propelled vehicle, the bathyscap

Trieste, designed by August Piccard; but vehicles like the Trieste and its French counterpart, Archimède, have serious limitations for commercial use: they require surface support; the use of aviation petrol for buoyancy is a hazard that limits the sea conditions in which they can successfully operate and they are unwieldy for engineering operations. Thus increasingly advanced vessels derived either from the precision-controlled, welded pressure hull have been or are being built not only for ocean engineering but also for scientific, tourist, rescue and military purposes. Some of these vessels, which do not require surface tenders, like bathyscaphs already have near bottom capability exceeding 2000 metres for extended periods of time. While further progress in the construction of the types of vessels described is possible, it is believed that if present materials—high strength steels and aluminum—continue to be used, rapidly increasing costs would inhibit extensive commercial and military intrusion into the deep sea. It appears, however, that we are close to a vital breakthrough in technology.

In a paper presented at the Conference on Law, Organization and Security in the Use of the Ocean held at Ohio State University in March this year, Dr. Craven stated:

"It has also been suggested by many that the problem of ocean-mining is remote and that exploiters will be relatively few. The presumption is the projected high cost of vehicles and equipment operating on the ocean bottom. It is the thesis of the author that low cost vehicles capable of exploitation are technologically feasible and will be realized within the next decade. This projection is based on three fundamental premises: one, that deep submersibles . . . will operate independently of the free surface; two, that materials for deep submergence will ultimately be less expensive than materials now in use for relatively shallow submersibles; and three, that free-flooded deep machinery will have been developed. It is surprising to the uninitiated and even to some professionals . . . to realize that at present the major investment cost of deep submersibles is in the surface ships and surface support . . . This is so, because, except for static pressure, the greatest forces and most dangerous dynamics are at or near the surface and its attendant wave systems. . . . The resulting elimination of surface support will provide the greatest cost reduction in the system operation.

"The second greatest potential is in materials for deep submergence. Much has been said in the past about the promise of glass and ceramics for use as a low-cost hull material. . . . Perceptible progress has been made." (Volume II, pp. 17-18)

"The third aspect is the development of freeflooding machinery capable of operating in the deep sea. Such equipment has indeed been built and employed. . . . A costly development programme should see a commercially available capability for tethered, unmanned vehicles or even tethered, manned vehicles capable of exploiting the deep sea in the near future." (Volume II, p. 19)

In a further paper published in the Proceedings of the U.S. Naval Institute in April 1966 Dr. Craven described at some length the advantages of using massive glass pressure hulls. I shall not go into technical details. All I say in this respect is that deep submergence vehicles, utilizing these new techniques, are now under construction; they will be capable of operating at depths exceeding 700 metres for prolonged periods. They will come into operation within the next two years.

A second major technological development which is making the sea-bed accessible and exploitable resides in the adaptation of the physiology of man to permit him to operate freely in the ocean at depths at least as great as those of the geophysical continental shelf. The major innovation here is the application of the technique of saturation diving. In this technique, the diver is compressed in an artificial atmosphere (usually oxygen, nitrogen and helium) appropriate to the depth at which he is to operate until the gasses dissolved in his body fluids and body tissues are at an equilibrium. Once appropriately saturated the diver may make limited excursion to deeper depths but may not safely enter shallower water without long and careful decompression. It has been observed that from the surface an excursion to 70 metres is near the maximum; from 70 metres to 150 metres is more easily tolerated; from 150 metres excursions up to 300 metres—well beyond the geophysical continental shelf isobath—appear to be permitted. The ability to do protracted work on the sea-bed requires the technological capability to heat the diver while he is in the water and a dry chamber which can be occupied during non-working hours. The Conshelf and Sea Lab I and II experiments have demonstrated that this capability exists

and that man can live without excessive difficulty and operate with considerable freedoms for periods up to one month at depths up to nearly 100 metres.

Sea Lab III, which will take place next year, should prove man's ability to live efficiently for long periods at a depth of 150 metres with limited excursions to well over 220 metres. It is difficult to forecast the potential of the saturated diving technique; despite the complex problems involved in the acclimatization—but I would say, reacclimatization—of man to the ocean depths. Admiral Waters confidently predicts that by 1975 "we will have colonies of aquanauts living and working . . . at depths in the neighbourhood of 1,500 feet—that is nearly 500 metres". In any case some of the summits of the great submarine mountain ranges are already within range of permanent occupation by man and the technology exists now, or is about to be developed, which will make vast areas beyond the continental shelves both accessible and exploitable.

A series of considerations will strongly encourage early employment by nations of the techniques which they have developed. From a commercial point of view, exploitation of on-bottom or sub-bottom resources of the ocean floor has many advantages over exploitation of any but the richest and most favourably located land resources: prolonged negotiations with sometimes unsympathetic foreign governments are avoided, labour costs are minimized, transport costs reduced, and so on. From the point of view of governments of technologically advanced countries, assurance of adequate and independent sources of supply of petroleum, natural gas and many minerals vital to industry eliminates a dangerous import dependency in peace and war and a major factor in foreign exchange difficulties. Finally there are grave considerations of a security and defence nature that impel the major Powers to appropriate areas of the ocean floor for their own exclusive use.

The latter is a somewhat sensitive subject which I would have preferred to avoid, but my silence would not prevent security considerations from weighing heavily, and perhaps decisively, on the attitude that will be taken by different countries on the proposals which we shall make. My delegation must, therefore, show some awareness of the difficult problems that some countries face. I shall not attempt a strategic analysis but I will limit myself to describing briefly some of the developments we anticipate if the United Nations does not take urgent action.

We are all aware of the importance of the sea for defence purposes: from the sea the vastest land masses can be dominated, and the sea in turn is dominated, and can be dominated from the sea floor. The importance of the sea increases rather than decreases in the age of the nuclear submarine. The development of a technology that permits the physical occupation and military use of large areas of the sea-bed beyond the continental shelf drastically alters traditional constraints on the use of the sea with consequences which even experts may find difficulty fully to assess at the present time; in any case a new dimension is added to strategy.

We all know that extremely powerful and sophisticated land-based nuclear missile systems have been developed and are being constantly refined, but the very technology that has made the development of these systems possible, has also provided the means for their destruction. What could be more attractive in the era of multiple war-head ballistic missiles, capable of overwhelming defences and destroying land-based hardened missile sites, than to transfer offensive and defensive capability to the seas, an environment highly resistant to the over-pressures of nuclear attack. This indeed has already occurred to some extent with the development of nuclear-powered submarines equipped with nuclear missiles: the present inestimable advantage of these vessels is that they can maintain the balance of terror by guaranteeing a measure of second strike capability since they are almost immune to detection. This immunity and hence this second strike capability could, however, be seriously impaired were tracking devices (which incidentally are already available) installed in suitable areas of the deep seas and of the ocean floor. Such devices can be used, of course, for scientific and commercial purposes, for instance as aids to navigation and for the charting of fish migrations, but they can also be used to detect and to trail possible hostile submersibles.

Deployment of an anti-ballistic missile system on suitable areas of the ocean floor, such as on the oceanic mountain ranges, could prove an effective counter to multiple war-head missiles aimed at land targets. The advantages of such a system are obvious: more than one strike at incoming missiles would be possible; secondly, incoming multiple war-head missiles could be attacked before the several war-heads separate.

Mobile near bottom nuclear missile systems can be conceived which, while immune from any presently conceivable form of detection, would provide immense offensive capability.

Establishment of fixed military installations on the ocean floor might also be found useful for many purposes.

A high degree of self-sufficiency could be obtained for the various military installations hypothetically envisaged by the construction of nuclear power plants providing oxygen by the electrolysis of sea-water while sufficient nutrients exist in the sea to provide ample supplies of food.

Thus the advantages of proceeding to utilize the deep seas and the ocean floor for military purposes might at first sight appear compelling to the country or countries possessing the requisite technology. Yet there are disadvantages to such course of action.

Since more than one country is able to utilize the deep seas and the ocean floor for military purposes, we can expect an immediate and rapid escalation of the arms race in the seas, if any of the hypothetical developments that I have mentioned were known to have taken place beyond the limits of the geophysical continental shelf. There would certainly be a race to occupy accessible strategic areas on the ocean floor without much regard to the claims that other nations, not having the capability to occupy these areas, might put forward. Military installations on or near the ocean floor require protection against spying or harassment, this would almost inevitably lead to unilaterally proclaimed jurisdiction over large areas of the surrounding and superjacent sea; and the consequent curtailment of lawful traditional activities on the high seas would be bitterly resented by many countries. We can only speculate also on what counter-measures would be taken against any specific action to militarize any area of the deep seas or of the ocean floor beyond the continental shelf. It is certain that effective counter-measures are possible: thus the effectiveness of acoustic detection and surveillance devices installed in the ocean could be destroyed by insonifying parts of the oceans themselves. This would be effective militarily but it would also render near bottom navigation for all purposes, including scientific purposes, extremely hazardous and would render fishing sonar virtually unusable.

In conclusion I would submit that the utilization for military purposes of the deep seas and of the accessible ocean floor, while perhaps attractive at first sight, might provoke political, military and economic complications of such magnitude as to compel very careful assessment of the probable consequences by the Powers concerned. I would respectfully urge upon the major Powers the utter futility of attempting to obtain a temporary military advantage by using the ocean floor, beyond the geophysical continental shelf for military purpose. Legitimate defence needs and the balance of terror as well as the interests of all countries, can far better be safeguarded by developing within an international framework credible assurances that the sea-bed and the ocean floor will be used exclusively for peaceful purposes. This has already been done with respect to outer space. We trust it will also be possible to do so with respect to the ocean floor.

Unfortunately the present juridical framework clearly encourages, subject to certain limitations, the appropriations for national purposes of the sea-bed beyond the geophysical continental shelf.

As I have already had occasion to mention, the sea-bed and the ocean floor are land. There are five generally recognized modes of acquiring land in international law: cession, subjugation, accretion, prescription and occupation. In the interests of brevity, I shall deal only with the latter.

Occupation is a mode of acquisition recognized by international law involving the intentional appropriation by a State or territory not already under the sovereignty of another State. Generally recognized principles of international law with regard to occupation may be summarized as follows. Effective occupation is required: possession and administration are two prerequisites to effective occupation. The extent of occupation required to establish title depends in practice upon the nature of the territory involved: the more remote or inaccessible the territory the less is the degree of control required by traditional international law to acquire title. Thus in the nineteenth century occupation of strips of coast in Africa was deemed to confer rights, the exact nature and extent of which was disputed among the Great Powers, on the hinterland, also vaguely defined, over which in effect little control was exercised by the Power occupying the coast. In the 1933 East Greenland case the Permanent Court of International Justice

gave support to the doctrine of contiguity as applied to remote areas, by holding that colonization of a part of Greenland served as effective occupation of the whole. These traditional concepts still constitute a valid background to present international law regarding the ocean floor, which has developed in the past twenty years on the basis of unilateral action taken by States in response to needs: action subsequently endorsed by the international community. The first and most significant event in the development of the present legal structure was the Truman Proclamation of 1945 issued at a time when the United States, having acquired an advanced technical capability, was faced with the problem of acquiring jurisdiction and control over the continental shelf. The Proclamation declared that since modern technology was capable of expoliting the resources of the continental shelf, since recognized jurisdiction over such resources was necessary and since the exercise of such jurisdiction by the contiguous State was just and reasonable, the United States, therefore, regarded the resources of the shelf contiguous to the United States as "appertaining to the United States and subject to its jurisdiction and control" without this in any way affecting the character of the high seas above the shelf.

The continental shelf was not defined in the Proclamation but a subsequent State Department Press release stated that it was delimited by the 100 fathom (200 metre) isobath. The Proclamation totally rejected the concept of the continental shelf as *res omnium communis*—a point on which there had been considerable dispute previously among legal experts—and avoided explicitly founding assertion of jurisdiction on the *terra nullius* occupation theory of acquisition of territory, preferring instead to justify the action taken on the assumption that the continental shelf is the geological extension of the littoral State and that the coastal State has a reasonable right to regulate activities off its shores.

The Proclamation was followed by pronouncements from a number of States asserting various rights, including sovereignty, over vast areas of the ocean floor extending at great distances beyond their territorial waters. Although protests were filed against such extensive declarations virtually no opposition was registered against the Truman Proclamation and other similarly limited claims. The general acquiescence of the international community to the assertion of jurisdiction and control over the resources of the shelf by the littoral State may be construed as evidence—controverted, however, as late as 1951 by Lord Asquith in the Abu Dhabi case—that a new rule of international law had been established. There existed, however, an evident necessity for uniformity with regard to the claims of States to the continental shelf and, at the request of the General Assembly, the International Law Commission studied the problem. The work of the International Law Commission was eventually considered by the Geneva Conference on the Law of the Sea, and this in turn resulted in the drafting of the Convention on the Continental Shelf of 29 April 1958, which came into force in 1964 and which embodies the current state of present international law.

The Convention recognizes the right of the coastal State to exercise sovereign rights over the continental shelf defined as:

"(a) the sea-bed and the sub-soil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas;

(b) to the sea-bed and sub-soil of submarine areas adjacent to the coasts of islands."

The rights of the coastal State are made explicitly independent of "occupation, effective or notional" or of "any express proclamation". Detailed rules for the delimitation of the continental shelf between adjacent States or States whose coasts are opposite each other are made in article 6 of the Convention. The sovereign rights of the coastal States are subject to the limitations mentioned in article 5 and are declared not to affect the legal status of the superjacent waters as high seas.

At the time of its conclusion, the Convention was hailed as a major achievement of the United Nations. So convinced were legal experts of its excellence that revision was made difficult; not before five years after entry into force, that is not before 1969, can any request for revision be entertained and even then "the General Assembly of the United Nations shall decide upon the steps, if any, to be taken in respect of such request." (Article 12 (2)).

I shall not presume to comment on the virtues of the Continental Shelf Convention; undoubtedly it was believed that prompt and orderly disposition had been obtained of a new problem of international concern. Unfortunately, how-

ever, the framers of the Convention were not in touch with developing technology and apparently did not conceive of the possibility that the sea-bed could be exploited both for military and commercial purposes at depths beyond the arbitrarily selected 200-metre isobath.

As Grunawalt states in an article published in the *New York Law Journal* of 24 January 1967, "the definition of the continental shelf, as incorporated in the Convention, is a compromise between the 200-metre rule advocates—proponents of fixity and certitude—and depth of exploitability proponents", that is, advocates of the need for flexibility.

In the light of current technological developments, however, the compromise turns out to be no compromise at all; it is clear that the sea-bed beyond the 200-metre isobath will soon be subject to exploitation. The only question is, would it be exploited under national auspices for national purposes, or would it be exploited under international auspices and for the benefit of mankind? The wording of the Convention, whatever may have been the intentions of its authors, provides powerful legal encouragement to the political, economic and military considerations that are inexorably impelling technologically advanced States to appropriate the sea-bed and the ocean floor beyond the 200-metre isobath for their own use.

The definition of the continental shelf, as incorporated in the 1958 Geneva Convention, has lent itself to two basic interpretations.

The first is based on the idea, first authoritatively enunciated in the Truman Proclamation, that the shelf is but the geophysical extension of the coastal State's land mass and that, therefore, it is just and reasonable that the littoral State should lay claim to its resources. This theory gives considerable weight to the word "adjacent" in the second line of article 1 of the Continental Shelf Convention. Thus it is held that there are three elements defining the submarine areas included in the continental shelf: the 200-metre isobath, depth of exploitability and adjacency, or at least some vague degree of proximity, to the coast. In support of this view, it is maintained that a careful analysis of the proceedings of the Fourth Committee of the United Nations Conference on the Law of the Sea shows that the deep sea floor, with the possible exception of areas immediately adjacent to the coasts, cannot be included within the scope of the Continental Shelf Convention.

Exponents of this approach recognize the existence of a possible legal problem with regard to submarine areas situated under still undefined depths of water and at a still undefined distance from the coast. They advocate either delaying the establishment of a legal regime for these, I repeat, still undefined areas until their utilization for military or commercial purposes forces the issue, or suggest in the words of Northcutt Ely that "until enough international competition and friction develop to justify the creation of some advance license system . . . recognition of the flag of the raft or other surface mechanism from which the exploration is controlled sufficiently identifies the jurisdiction which ought to have plenary control over the exploration and over the exploitation of the resources so discovered".

Apparently the distinguished author did not envisage the possibility either of commercial or military, manned or unmanned permanent installations on the ocean floor without surface support, or the possibility of attempts at competitive exploitation of the same mineral or petroleum deposit.

The above interpretation of the 1958 Geneva Convention has, however, not gone unchallenged since it is in direct contradiction to the explicit wording of article 1(a), which states that the continental shelf extends "to the submarine areas adjacent to the coast . . . to a depth of 200 metres and beyond that limit to where the depth of the superjacent waters admits of the exploitation of the resources of the said areas". Thus an influential school of thought denies the possibility of any legal problem whatsoever. Professor Shigeru Oda of Tohoku University, for instance, points out that "there is no room to discuss the outer limits of the continental shelf or any area beyond the continental shelf under the Geneva Convention since . . . all the submerged lands of the world are necessarily parts of the continental shelf by the very definition of the Convention."

Under this concept a coastal State, as its technical capability develops, may extend its jurisdiction across the deep sea floor up to the midway point between it and the coastal State opposite, in accordance with the rules contained in article 6 of the Convention. Such an interpretation gives the governing Powers of islands such as Clipperton, Guam, Azores, St. Helena or Easter, sovereign rights over millions of square miles of invaluable ocean floor.

More important than the opinion of jurists, however, and however distinguished they may be, is the action taken by Governments; and such action appears to be increasingly based on an interpretation of the 1958 Geneva Convention even more far-reaching than that of Professor Oda. For instance, the United States has already leased tracts of land situated under water several hundred fathoms deep and well beyond its territorial waters, basing itself on a Department of Interior legal memorandum which holds that the leasing authority of the United States under the Outer Continental Shelf Lands Act "extends as far seaward as technological ability can cope with the water depth, this is in accord with the Convention of the Sea adopted at Geneva". This practice is spreading.

Thus, for instance, following the phenomenal discoveries of natural gas to which we have already referred, the bed of the North Sea was distributed among the littoral States in 1964 in accordance with the rules contained in article 6 of the Geneva Convention, but with little regard either to the geophysical features of the sea-bed—for instance, the deep trench clearly separating the geological continental shelf of Norway from that of the other States—or to the principles of adjacency and depth of water stressed by the first school of thought that we mentioned. Vast deposits of natural gas have been discovered in the Baltic, and no doubt we shall soon be informed that the bed of this shallow sea has also been parcelled out among the riparian States.

In citing the action taken by States, I intend no criticism; there is little doubt that the sea-bed of the Baltic and of most of the North Sea can come within a reasonable geophysical definition of the continental shelf. I would stress, however, that much more far-reaching action to appropriate the sea-beds can clearly be foreseen at the present time. When this action is taken it will be irreversible by the international community and will entail not only immense prejudice to all land-locked countries but also to most of the coastal States that do not have the requisite technical competence to exploit the ocean floor. Underdeveloped States fronting on an ocean might believe that a division of the ocean floor of the world would be advantageous to them. This is a complete—and I should like to reinforce this—and utter illusion. Is it credible that technologically advanced countries would be deterred from exploiting rich mineral resources on the ocean floor situated at some distance from the nearest coast of another country for the sole reason that these deposits happened to be under the theoretical jurisdiction of a State unable to exploit them? Indeed voices are already being raised interpreting article 1 of the 1958 Geneva Convention as giving licence to a coastal State facing the ocean to extend its jurisdiction over the ocean floor as far as its technology permits exploitation; in the words of Franklin "the only limitation to exploitation will be that of technology".

It is even less credible that technologically advanced countries, encouraged by the terminology of the juridical masterpiece produced by the International Law Commission, would agree to adopt a restrictive interpretation of their rights under the Geneva Convention when their defence needs are directly involved. Only recently *U.S. News and World Report* of 16 October 1967—a few days ago—revealed that certain quarters were considering the possibility of sinking nuclear missiles in capsules under the sea "off potential enemy coasts with a remote controlled mechanism for firing". "Off potential enemy coasts . . ." of course, outside territorial waters, but there is no longer any question here of respecting theoretical median lines between States whose coasts are opposite each other.

Even the traditional freedom of the high seas, one of the few things explicitly safeguarded in the 1958 Geneva Convention, is gravely endangered, should a militarization of the ocean floor be allowed to take place. The legal argument that could be developed in this connexion might read as follows: It is a traditional principle of international law that a State exercising sovereignty over land also exercises jurisdiction over the superjacent atmosphere up to the still undefined limits of outer space, but the sea is the atmosphere of the ocean floor, hence a State exercising sovereignty over an area of the ocean floor also has a claim to jurisdiction over the superjacent sea despite the wording of article 3 of the 1958 Geneva Convention. Any legal argument of this nature would, of course, be very strongly controverted by the many members of the international community, but the issue will not be decided by legal arguments but by the vital need to control transit in the vicinity of any military installations that may be established on the ocean floor. This is not the fruit of my imagination; it is not an invention of the Government of Malta. I am reproducing here, perhaps crudely but not unfaithfully, views held by military experts of more than one country. For in-

stance, a distinguished and internationally known expert, whose name I shall not mention, stated this year:

"Military installations are now centered reasonably close to the land mass; that will not be the case . . . ten years from now. We will carve out rather large chunks of the ocean away from the land masses which we . . . regard as very important to our national defence and . . . we shall deny . . . access by any other nation to the areas which we will block out."

We have seen that the potential implications of the 1958 Geneva Convention on the Continental Shelf are gravely prejudicial to all countries, whether landlocked or not, that do not possess either the financial resources or the technical competence to maintain their position in the oceanographic technology race. By encouraging the establishment of a plurality of national jurisdictions on the ocean floor, the Geneva Convention, unfortunately, also impedes a solution, beneficial to all countries, of the grave problem of the disposal of radio-active wastes.

It is true that a complementary treaty, the 1958 Geneva Convention on the High Seas prescribes in article 25:

"Every State shall take measures to prevent the pollution of the seas from the dumping of radio-active waste, taking into account any standards and regulations that may be formulated by the competent international organization."

But, apart from the fact that by no means all States have ratified the Convention on the High Seas, the problem by its very nature is hardly susceptible to a satisfactory solution in the present legal context.

The question of preventing the pollution of the seas from the discharge of radio-active wastes has been the subject of prolonged consideration by the International Atomic Energy Agency. A panel of experts, convened by the IAEA, concluded preliminary consideration of the problem in 1960 by issuing a report—Safety Series No. 5, IAEA, 1961. The report, while recognizing "the subtle and persistent nature of the hazards of radioactivity" which make it desirable in this field that safe waste disposal practices be initiated from the beginning, did not express undue alarm. The attraction of the sea "as an environment for the application of the dilution and dispersal technique for waste disposal" were acknowledged and it was stated that "the bottom of the deep sea can safely receive much greater quantities of radio-active wastes than can be allowed on the continental shelf". And we can all unanimously agree that the sea can receive greater quantities of radio-active wastes than can be allowed on the continental shelf.

The report continues:

"After a brief, but factual and comprehensive review of the problem, the expert panel in its recommendations, oriented, however, almost exclusively towards avoiding an unacceptable degree of hazard in man as distinguished from plant life and sea living biota, reached the following conclusions:

"(1) At present, the release into the sea of highly radio-active wastes from irradiated fuel cannot be recommended as an operational practice;

"(2) Wastes of low and intermediate activity may be safely disposed of into the sea under controlled and specified conditions . . .".

And in this connexion the panel suggested various precautions that it would be advisable to take with regard to selection of disposal sites, packaging of radio-active wastes, etc.

The expert panel also recommended that—

"(8) All authorities setting up disposal sites in the sea should provide to a suitable international authority information necessary to maintain an adequate register of radio-active waste disposal into the sea;

"(9) The IAEA should maintain this register and should receive:

(a) notice of the licensing requirements of all sea-disposal areas set up by national authorities . . .

(b) annual reports on the state of such sites . . .

(c) the monitoring programme and all relevant scientific findings;

"(10) The IAEA should provide for any necessary standardization of monitoring techniques". (*Security Series No. 5*, p. 78)

My country is not a member of the International Atomic Energy Agency and unfortunately it has not been possible for us to obtain access to the records of the discussions in that Agency on this subject. The annual Reports of the Board of Governors, however, are not very informative on this question; apparently there has been a considerable amount of research and discussion, technical manuals have been published, note has been taken of the introduction of more stringent national disposal rules, meetings have been held "to co-ordinate ex-

change of information on waste management disposal practices and waste management research" (Annual Report 1963/64) and "progress has been made in converting high activity liquid wastes into inert solids" and so forth (Annual Report 1964/65), but little light is thrown in all these reports on the vital question of whether the recommendations of the 1961 expert panel were in fact endorsed by the International Atomic Energy Agency and on the extent to which those recommendations have in practice been followed by the international community as a whole. We hope that during this debate it will be possible for my delegation to obtain authoritative information on the following points: whether an international register of radioactive waste disposal into the sea has in fact been established and how comprehensive that register is; whether, and how many, annual reports are received by IAEA on sea-disposal sites established by national authorities; whether a comprehensive world-wide monitoring programme has in fact been established and whether monitoring techniques have been standardized.

In any case, I have found no evidence that any legally binding international instrument setting limits to and rules for the disposal of radioactive waste materials into the deep sea is in force at the present time, nor does there appear to be in operation any effective international system of ascertaining scientifically and systematically, on a world-wide basis, damage to the marine environment caused by present waste disposal practices.

I am aware that this question has attracted some controversy. At the 1966 Vienna Symposium on the disposal of radioactive wastes into the seas, oceans and surface waters, some of the papers presented minimized the possibility of hazards, assuming, of course, appropriate disposal techniques. Among the several papers that reached this conclusion, with varying qualifications however, the one presented by Rodier and others was perhaps the most categorical. I shall quote its conclusions.

(Spoke in French)

"In the course of the seven years that have elapsed, the disposal of radioactive liquid waste products from the Marcoule Centre into the Rhone has been carried out in very satisfactory conditions. Regulation of the amounts of radioactive elements to be disposed of has never been an obstacle to the operation of the production installations. Moreover, no accidental or abnormal pollution of the Rhone has been registered." (*Proceedings of the Symposium on the disposal of radioactive wastes into the seas, oceans and surface waters*, Vienna 1966, p. 722.)

(Continued in English)

On the contrary, however, Vdovenko, Gedeonov, Kolesnikov and others presented a paper based on the observations carried out during the 1963/64 oceanographic campaign of the research vessel *Mikhail Lomonosov* which concluded that—

"extremely high concentrations of strontium 90 and caesium 137 were detected in the equatorial zone of the Atlantic, exceeding the mean Atlantic level by a factor of 5-6 and by a factor of 14 at a depth of 1,000 metres. This abnormal concentration cannot be explained by reference to the atmospheric sources of contamination. The established fact of a considerably increased content of strontium 90 and caesium 137 in the ocean as compared to land, together with the discovery of abnormally contaminated areas in the ocean, point to the possibility of other sources of contamination of the Atlantic in addition to that represented by the atmosphere". (*Ibid.*, p. 425)

A further paper by Belyaev and others demonstrated that strontium 90 concentrations in the Black Sea exceeded those of the Atlantic Ocean, that surface contamination rapidly penetrates to the bottom, and that "solid or liquid wastes even if disposed of at the bottom rapidly reach the surface". Feldt, expert of the *Bundesforschungsanstalt für fischerei*, studying radioactive contamination of North Sea fish, concluded that there had been "no decrease in contamination of fish since cessation of the atmospheric bomb testings and that "the processing of fish meat by boiling and frying has no observable effect on decontamination". (*Ibid.*, p. 751)

Since the papers submitted show marked differences in the conclusions of experts as to present hazards with regard to present practices of radioactive waste disposal into the sea, perhaps the only conclusion that a non-expert can draw at this stage from the available evidence is that, although hazards to man have not yet reached an acute stage, and although serious damage to the marine environment can be demonstrated only in a few areas, the whole question deserves far greater and deeper consideration than it has received heretofore.

We are reinforced in our view by the knowledge that the use of nuclear power is rapidly increasing and may be expected to continue to increase, with the possible consequence that ever increasing quantities of radioactive waste may be dumped in the sea, chiefly because that method of disposal is cheaper and more convenient in some cases than reducing the wastes to solids and disposing of them in safe burial grounds. The ultimate implications of the continuation of present popular methods of radioactive waste disposal in the sea is well described by Jacques-Yves Cousteau in a passage of his book *The Living Sea*. Describing a meeting convened by the *Délégation Générale à la Recherche Scientifique* he writes, and I quote from the translation:

"However, the most popular refuse dump with the atomists was the ocean. Several delegates spoke matter-of-factly of how their countries were already sinking the stuff in the sea.

"The differences between the physicists and biologists were now pronounced. After the meeting adjourned, dignified gentlemen exchanged impassioned dialogues. I heard one biologist say 'Strontium 90 will contaminate fish.'

"A nuclear physicist replied, 'Strontium 90 concentrates only in the bones. Who eats the bones?'

"'Chickens eat them', the oceanographer said. 'Bonemeal is a by-product of fish canning. Our children's eggs will become radio-active.'

"Professor A is a calm, reflective person. He said gently, 'Jacques, this is not the problem. There is only one problem for the future of mankind, and that is the population explosion. Soon we will have ten billion people, later twenty. Perhaps it will reach one hundred billion. We will have to feed all these people. The natural resources of the sea and land put together will fall far short. But, thank God, there is an equivalence between food and energy. We will have to develop nuclear energy without limit to run factories that will produce the protein to feed the whole of mankind, no matter how many. That is why we must go full steam ahead with atomic energy, even at the cost of closing the sea to all human use, including navigation.'"

Cousteau comments: "We risk poisoning the sea for ever just when we are learning her science, art and philosophy and how to live in her embrace."

Does the international community wish this to happen?

The question of the prevention of the pollution of the seas from the discharge of radio-active wastes is, of course, but one aspect of the wider problem of marine pollution. Uncontrolled dumping of detergents, pesticides and heavy metal and petrochemical wastes into the sea can be almost as hazardous to health and food supplies as the dumping of radio-active wastes. Outlining this wider problem recently, Prof. Paul Korringa of the Netherlands Institute for Fishing Investigations, described the effect on marine life of a comparatively small amount of copper sulphate dumped into the North Sea: "... in two weeks' time the poisonous body of water, killing both fish and invertebrates, had moved along the coast quite a distance, but it was not yet diluted as much as five times ...". Wastes create such dramatic phenomena as the notorious "red tide", poisonous phytoplankton which kills so much of the fish life of the ocean and destroys whole populations of fish. Various aspects of the question of waste disposal into the marine environment are the concern of a number of United Nations agencies in addition to IAEA; IMCO has competence over wastes discharged from vessels—a competence with which it has been actively concerned, particularly since the recent wreck of the "Torrey Canyon" created a certain problem off the coasts of the United Kingdom and France; FAO is, of course, concerned with the results of pollution in so far as they affect fish, while the Inter-governmental Oceanographic Commission, related to UNESCO, has considered in some detail the general scientific aspects of pollution. Plurality of jurisdiction, fragmentation of competence, a general lack of a sense of urgency, have unfortunately not resulted in effective international action to contain the massive problem of marine pollution.

I have spoken at some length yet I am deeply aware that I have not succeeded in treating the question before us as comprehensively as I would have wished. I dare not take too much more of your time. I shall, therefore, make some final observations on those aspects of the question which we have tried to elucidate, briefly review action taken within the United Nations system and then submit the proposals which my Government has instructed me to put forward for the consideration of this Committee.

The sea-bed and the ocean floor constitute nearly three-quarters of the land area of the earth.

Current international law encourages the appropriation of this vast area by those who have the technical competence to exploit it.

The known resources of the sea-bed and of the ocean floor are far greater than the resources known to exist on dry land. The sea-bed and the ocean floor are also of vital and increasing strategic importance. Present and clearly foreseeable technology also permits their effective exploitation for military or economic purposes. Some countries may therefore be tempted to use their technical competence to achieve near-unbreakable world dominance through predominant control over the sea-bed and the ocean floor. This, even more than the search for wealth, will impel countries with the requisite technical competence competitively to extend their jurisdiction over selected areas of the ocean floor. The process has already started and will lead to a competitive scramble for sovereign rights over the land underlying the world's seas and oceans, surpassing in magnitude and in its implication last century's colonial scramble for territory in Asia and Africa. The consequences will be very grave: at the very least a dramatic escalation of the arms race and sharply increasing world tensions, caused also by the intolerable injustice that would reserve the plurality of the world's resources for the exclusive benefit of less than a handful of nations. The strong would get stronger, the rich richer, and among the rich themselves there would arise an increasing and insuperable differentiation between two or three and the remainder. Between the very few dominant Powers, suspicions and tensions would reach unprecedented levels. Traditional activities on the high seas would be curtailed and, at the same time, the world would face the growing danger of permanent damage to the marine environment through radio-active and other pollution: this is a virtually inevitable consequence of the present situation.

These are the prospects that the world faces, not in a remote future, but as an immediate consequence of forces and pressures already at work.

Can these pressures be restrained through the continuation and normal expansion of the work already being undertaken within the United Nations system and by related inter-governmental bodies?

Nearly all United Nations agencies are directly or indirectly, actively or potentially, concerned with the seas: we have seen that the IAEA has done useful research on the question of radio-active waste disposal into the seas; ILO is concerned with the conditions of work of seafarers; FAO and other agencies with fisheries; IMCO and UNCTAD with shipping; WHO has a potential interest in the health of aquanauts. There are also WMO, UNESCO and other agencies.

The United Nations itself has been somewhat slow in entering the field; the basic resolutions are Economic and Social Council resolution 1112 (XL) of 7 March 1966, and General Assembly resolution 2172 (XXI) of 6 December 1966.

The former requests the Secretary-General

"to make a survey of the non-agricultural resources of the sea, beyond the continental shelf and of the techniques for exploiting these resources . . . (b) . . . to attempt to identify those resources now considered to be capable of economic exploitation, especially for the benefit of the developing countries, (c) to identify any gaps in available knowledge which merit early attention, (d) to report on the progress of the survey at an early session of the Council".

General Assembly resolution 2172 (XXI) is later in date but vaguer in terminology; it

"Requests the Secretary-General, in co-operation with the United Nations Educational, Scientific and Cultural Organization and, in particular, its Intergovernmental Oceanographic Commission and the Food and Agriculture Organization of the United Nations and in particular, its Committee on Fisheries . . .".

World Meteorological Organization and other inter-governmental organizations concerned, and the Governments of interested member States to undertake a comprehensive survey of activities in marine science and technology, including that related to mineral resources development, undertaken by Members of the United Nations family of organizations and to formulate proposals for (a) ensuring the most effective arrangements for an expanded programme of international co-operation in the exploitation and development of marine resources, (b) initiating and strengthening marine education and training programmes.

The General Assembly further requested the Secretary-General:

"to set up a small group of experts . . . to assist him in the preparation of the comprehensive survey called for in paragraph 2 above and in the formulation of the proposals . . .".

and requested that the survey and proposals be submitted to the Advisory Committee on Science and Technology for its comments and that subsequently the

survey, the proposals and the comments be submitted to the twenty-third session of the General Assembly through the Economic and Social Council.

Quite a long and arduous journey, and it will be noticed also that the action so far is consigned to surveys of progress made in the technology and in the identification of resources that were identified many years ago.

Among inter-governmental bodies related to the United Nations system, there is no doubt that the fifty-eight-member International Oceanographic Commission, created by UNESCO in 1960, to co-ordinate oceanographic research at the inter-governmental level, has been the most active with regard to the specific question which we are now considering, that is the sea-bed and the ocean floor beyond the geophysical continental shelf.

The Commission has interpreted its terms of reference broadly and has been most active in promoting scientific co-operation at the inter-governmental level in all matters concerning the marine environment.

Recently the Commission has become increasingly concerned by the uncertainties and grave inadequacies of current international law in so far as it affects scientific investigation of the oceans. This year the Soviet Union proposed that the International Oceanographic Commission create a special working group on legal aspects of the studies of the ocean and utilization of oceanic resources in order to

“... prepare drafts of: (a) a convention on the basic principles of conducting scientific research on the high seas, and (b) a convention on the international norms of exploration and exploitation of the mineral resources of the high seas”.

In addition the working group was to provide the IOC secretariat with advice on legal aspects of scientific studies of the ocean. Finally, an international conference was envisaged to discuss and adopt the draft conventions (AVS/9/89, 3 April 1967). I have not before me the records of the fifth session of IOC now meeting at the headquarters of UNESCO; it is possible, however, that some delegations may have observed that the Soviet proposal concerning the preparation of a convention on the exploration and exploitation of the mineral resources of the high seas went somewhat beyond the competence of an exclusively scientific organization. In any case the International Oceanographic Commission in its resolution adopted a few days ago, on 27 October, limited itself to establishing a

“working group on legal questions related to scientific investigations of the ocean”,

and charged this group with:

“(a) considering legal aspects specifically related to scientific investigations of the nature and . . . resources of the ocean . . . with a view to indicating legal principles which should facilitate and guide scientific research . . .

“(b) preparing documentation concerning the effect of the law of the sea on scientific research and proposals relating both to the contribution of scientific knowledge to the development of the law of the sea and to the participation of the IOC in the deliberations of the United Nations and appropriate specialized bodies to assist them in taking proper account of scientific interests . . . in the consideration of the further development of the law of the sea.”

I am sorry the language is so involved, but it is not my language.

The International Oceanographic Commission in that resolution also informs the United Nations of the establishment of this working group and declares its readiness:

“(a) to assist in the consideration of the possible future development of the law of the sea, from the point of view of the scientific interests involved, and (b) to assist in the acquisition and distribution of scientific knowledge . . .

necessary for the optimum use of the seas in the interests of mankind. . . .”

This information, I think, should be considered by the General Assembly as an invitation to it to act in this matter.

From what I have stated I believe it can be reasonably deduced that while the specialized agencies and the United Nations itself may be doing valuable technical work in the fields within their competence, their activities have no prospect in any way of diminishing the pressures making for the competitive appropriation for national purposes of the sea-bed and ocean floor, nor do their activities give much prospect of coping effectively with massive problems of world-wide scope such as the problem of the pollution of the marine environment, since there is a complete lack of a general institutional framework which can provide focus and efficient direction to the fragmented activities that are

now going on. Furthermore, reliance by some agencies on the universal and spontaneous implementation by States of recommendations, however desirable, made by technical bodies may perhaps, we submit, be a little optimistic. We also note that the basic political problem has been carefully avoided in all the activities going on so far, and even in General Assembly resolution 2172 (XXI), which is the basic General Assembly resolution, everything is mentioned except the basic political problem. The only result that we can hope for from the study which is now being carried out by the Panel of Experts, which will meet again next year, is a long study and a long discussion of the scientific and engineering aspects of the question.

In the circumstances, it is not surprising that increasing concern has been expressed in unofficial quarters over the apparent lack of awareness in the international community of the implications of recent developments in technology in the context of the 1958 Geneva Convention on the Continental Shelf. Increasingly numerous voices have been raised stressing the urgency of considering the vital political questions involved and urging that clear legal provision be made for an international régime, administered by an efficient international authority over the sea-beds and the ocean floor beyond a variously defined continental shelf. I should like to pay a tribute in this connexion both to the Commission to Study the Organization of Peace and to the International Law Association for their excellent work in alerting public opinion and I would commend for careful study the documentation produced by them on the question we are considering. The latest proposal in favour of an international régime was put forward in July this year by the World Peace Through Law Conference which was attended by over 2,000 lawyers and judges from over 100 countries. That proposal was contained in resolution 15 which deserves to be cited:

"Whereas new technology and oceanography have revealed the possibility of exploitation of untold resources of the high seas and of the bed thereof beyond the continental shelf and more than half of mankind finds itself underprivileged, underfed and underdeveloped, and the high seas are the common heritage of all mankind,

"Resolved that the World Peace Through Law Center :

(1) Recommend to the General Assembly of the United Nations the issuance of a proclamation declaring that the non-fishery resources of the high seas, outside the territorial waters of any State, and the bed of the sea beyond the continental shelf, appertain to the United Nations and are subject to its jurisdiction and control."

Among the supporters of an international régime for the sea-beds and the ocean floor there are two main currents of opinion. One favours the creation of a new agency responsible for all oceanographic activities, including those concerning mineral resources of the sea. The other prefers to entrust all responsibility to the United Nations.

As an illustration of the former current of opinion I will cite the recommendation of the Joint ACMRR/SCOR/WMO Working Group to the effect that :

"member governments of the United Nations family and the various United Nations agencies give early and thorough consideration to the advisability and feasibility of establishing a Central Inter-governmental Oceanic Organization to deal with all aspects of ocean investigation and uses of the sea."

That recommendation is contained in the records of the Joint Meeting of the Working Group held on 17-21 July 1967.

On the other hand, other experts believe, like Christy, that an effective international régime can best be developed under the auspices of the United Nations since this:

"... is the one public international body ... that comes closest to meeting the requirements ... to achieve an international régime. The United Nations authority must acquire jurisdiction of the resources on and under the sea floor. This jurisdiction must permit it to part and protect exclusive rights of entrepreneurs ... and must also have the ability to tax or extract rent or royalty payments for the use of the resources and it must be given the ability to utilize or distribute these revenues in an acceptable manner."

[Resuming in afternoon session, November 1, 1967:]

Mr. Chairman, I am deeply conscious of the fact that the Committee is most anxious to proceed to the Korean question, and I have used the luncheon interval to drastically reduce what I had in mind to say.

From what I said this morning, I think it is clear that there can be no doubt that an effective international régime over the sea-bed and the ocean floor

beyond a clearly defined national jurisdiction is the only alternative by which we can hope to avoid the escalating tensions that will be inevitable if the present situation is allowed to continue. It is the only alternative by which we can hope to escape the immense hazards of a permanent impairment of the marine environment. It is, finally, the only alternative that gives assurance that the immense resources on and under the ocean floor will be exploited with harm to none and benefit to all.

Finally, a properly established international régime contains all the necessary elements which should make it acceptable to all of us here: rich and poor countries, strong and weak, coastal and landlocked States. Through an international régime all can receive assurance that at least the deep sea floor will be used exclusively for peaceful purposes and that there will be orderly exploitation of its resources.

You will note, however, that all proposals put forward up to now for an international régime have avoided facing the defence aspects of the question before us. Those aspects, in our opinion, are crucial for an enduring international solution of the problem. Appropriation for national purposes of the sea-bed and the ocean floor beyond the geophysical continental shelf has already started. My Government believes that the international community has no alternative in these circumstances but to aim consciously and with a sense of urgency towards the creation of an international régime, beyond, I repeat, reasonably defined national jurisdiction. In creating such a régime, we must face squarely the vital issues of legitimate national security together with the economic, scientific and other implications.

Our general objective must be to create conditions in the marine environment that will be of benefit to all countries. We do not believe that it would be wise to make the United Nations itself responsible for administering an international régime. We say this not because we have an objections of principle, but for practical reasons.

I shall not take your time to list them here. I would only observe that it is hardly likely that those countries that have already developed a technical capability to exploit the ocean floor, would agree to an international régime if it were administered by a body where small countries, such as mine, had the same voting power as the United States or the Soviet Union.

Hence, our long-term objective is the creation of a special agency with adequate powers to administer in the interests of mankind the oceans and the ocean floor beyond national jurisdiction. We envisage such an agency as assuming jurisdiction, not as a sovereign, but as a trustee for all countries over the oceans and the ocean floor. The agency should be endowed with wide powers to regulate, supervise and control all activities on or under the oceans and the ocean floor. It would be premature for me to elaborate on the provisions which could be incorporated in the charter of the suggested agency to ensure that the ocean floor be used exclusively for peaceful purposes. Perhaps, it will suffice at this stage to assure you that we have examined the question carefully and my Government is satisfied that it is feasible to give credible assurance to all countries that through the agency the ocean floor beyond national jurisdiction will in fact be used exclusively for peaceful purposes.

In our view the agency should have the power affectively to regulate the commercial exploitation of the ocean floor. We would envisage exploration rights and leases being granted in respect of mineral, petroleum and other resources lying in the area within its jurisdiction. We have made some hasty calculations on the amount of revenue which the agency could be expected to receive from such activities. On the assumption that an agency would be created in the year 1970, that technology will continue to advance, that exploitation will be commensurate with the presently known resources of the ocean floor, that exploration rights and leases will be granted at rates comparable to those existing at present under national jurisdiction and that the continental shelf under national jurisdiction will be defined approximately at the 200 metres isobath or at twelve miles from the nearest coast, we believe that by 1975, that is, five years after an agency is established, gross annual income will reach a level which we conservatively estimate at around \$6 million. After deducting administration expenses and all other legitimate expenses including support to oceanographic research, the agency would, in our view, still be left with at least \$5 billion to be used to further either directly or through the United Nations Development Programme the development of poor countries. The sum which I have mentioned is a conservative estimate. I would recall, in this respect, that the United States Government alone has received only from petroleum leases on its con-

tinental shelf in the last fifteen years the sum of \$3.6 billion. That is one country in respect of one product alone. Should the international agency be established and should revenues be approximately at the level which we estimate, the international aid picture will be completely transformed.

We also envisage the agency as the body with overall responsibility for keeping the problem of ocean pollution under control. The useful work of existing specialized bodies such as the International Atomic Energy Agency, the Inter-Governmental Maritime Consultative Organization and others would not be jeopardized. Their collaboration would be solicited and their advice, if endorsed by the agency, could be incorporated in an enforceable code of law for the accepted use of the deep seas and of the ocean floor. We believe that the existence and powers of the suggested agency should be founded on a treaty clearly defining the outer limits of the continental shelf subject to national jurisdiction, and establishing generally acceptable principles with regard to the use of the deep seas and of the ocean floor. We are strongly of the opinion that the following, among other principles, should be incorporated in the proposed treaty:

"1. The sea-bed and the ocean floor, underlying the seas beyond the limits of national jurisdiction as defined in the treaty, are not subject to national appropriation in any manner whatsoever.

"2. The sea-bed and the ocean floor beyond the limits of national jurisdiction shall be reserved exclusively for peaceful purposes.

"3. Scientific research with regard to the deep seas and ocean floor, not directly connected with defence, shall be freely permissible and its results available to all.

"4. The resources of the sea-bed and ocean floor, beyond the limits of national jurisdiction, shall be exploited primarily in the interests of mankind, with particular regard to the needs of poor countries.

"5. The exploration and exploitation of the sea-bed and ocean floor beyond the limits of national jurisdiction shall be conducted in a manner consistent with the principles and purposes of the United Nations Charter and in a manner not causing unnecessary obstruction of the high seas or serious impairment of the marine environment."

There are other important principles which we could mention, but here again I am aware that time presses.

These are our long-term objectives. We realize that they cannot be achieved either quickly or easily. We hope, however, that the General Assembly will at its present session adopt a resolution embodying the following concepts:

1. The sea-bed and the ocean floor are a common heritage of mankind and should be used and exploited for peaceful purposes and for the exclusive benefit of mankind as a whole. The needs of poor countries, representing that part of mankind which is most in need of assistance, should receive preferential consideration in the event of financial benefits being derived from the exploitation of the sea bed and ocean floor for commercial purposes.

2. Claims to sovereignty over the sea-bed and ocean floor beyond present national jurisdiction, as presently claimed, should be frozen until a clear definition of the continental shelf is formulated.

3. A widely representative but not too numerous body should be established in the first place to consider the security, economic and other implications of the establishment of an international regime over the deep seas and ocean floor beyond the limits of present national jurisdiction; in the second place, to draft a comprehensive treaty to safeguard the international character of the sea-bed and ocean floor beyond present national jurisdiction; and in the third place to provide for the establishment of an international agency which will ensure that national activities undertaken in the deep seas and on the ocean floor will conform to the principles and provisions incorporated in the proposed treaty.

We have prepared a draft resolution embodying the points I have mentioned. We are reluctant, however, to submit it officially for consideration by this Committee. The question of the sea-bed and ocean floor beyond present national jurisdiction is of a vital importance to all of us. It is also a matter in which the concurrence of all is essential. We are not anxious, therefore, to engage publicly in the usual controversy which often precedes the adoption of a resolution. We do not wish to divide this Committee. We propose instead to appeal to moral concepts, to reason and to well-understood national interest. I would accordingly formally request you, Mr. Chairman, to appoint a small but widely representative group to consult together and to elaborate a draft resolution which, we would hope, may be acceptable to all, or at least to the great majority of Member States.

APPENDIX 10

STATEMENT BY AMBASSADOR ARTHUR J. GOLDBERG, UNITED STATES REPRESENTATIVE TO THE UNITED NATIONS, IN COMMITTEE I, ON THE QUESTION OF THE RESERVATION EXCLUSIVELY FOR PEACEFUL PURPOSES OF THE SEA-BED AND THE OCEAN FLOOR, NOVEMBER 8, 1967.¹

Mr. Chairman, this is my first opportunity to speak before the First Committee at this Session. And I wish to use it to express the pleasure and satisfaction of the United States Delegation at your unanimous election as our presiding officer.

From time to time in the past, you served as Chairman in an acting capacity. On those occasions, the entire Committee was impressed by the objectivity, decisiveness and integrity you brought to your work. We are grateful, but hardly surprised, that you have continued to display these same characteristics since your election this year—and confident you will continue to guide the Committee's work in the same spirit throughout this Session.

With its consideration of the Maltese Item concerning the Seabeds and Ocean Floor, the General Assembly has responded to the increasing awareness that one of man's oldest environments, the ocean, is also his newest and perhaps most valuable frontier. I would like to express my Delegation's gratitude to Ambassador Pardo for bringing this important question to the attention of the General Assembly.

My Delegation believes that mankind's expanding activities in the ocean depths call for new efforts for international cooperation, both in promoting the exploration and use of the deep ocean and its floor, and in the development of the general principles which might usefully guide man's activities in this new realm.

The premise on which the United States bases its position concerning a future legal regime for the deep ocean floor is straightforward. It was stated by President Johnson on July 13, 1966: "Under no circumstances, we believe, must we ever allow the prospects of rich harvest and mineral wealth to create a new form of colonial competition among the maritime nations. We must be careful to avoid a race to grab and to hold the lands under the high seas. We must ensure that the deep seas and the ocean bottoms are, and remain, the legacy of all human beings."

This means, in our view, that the deep ocean floor should not be the stage for competing claims of national sovereignty. Whatever legal regime for the use of the deep ocean floor may eventually be agreed upon, it should ensure that the deep ocean floor will be open to exploration and use by all states, without discrimination.

United Nations interest in the problems of the seas is not new; we are not writing on a clean slate in considering how the General Assembly can best deal with the question which has been brought before us. In the fifties, after extended work by the United Nations International Law Commission, a number of important Law of the Sea Conventions were adopted at a conference held in Geneva in 1958. One of these, the Convention on the Continental Shelf, is of particular interest to us in considering legal arrangements which might apply to the deep ocean floor. Under these conventions, the General Assembly was assigned the responsibility of deciding what steps should be taken with respect to requests for revision of the conventions.

A number of bodies in the United Nations have also given careful attention to other marine problems. Through the Intergovernmental Oceanographic Commission, UNESCO has actively encouraged scientific activities in the field of oceanography: the Food and Agriculture Organization has been concerned with the development and conservation of fisheries; the World Meteorological Organization is studying the influence of the oceans on weather; and the Intergovernmental Maritime Consultative Organization has done invaluable work in safety at sea.

¹ Source: United Nations Press Release USN-182, November 8, 1967.

The General Assembly last December endorsed a study of the present state of knowledge of marine resources requested by the Economic and Social Council, and asked the Secretary General to undertake, in addition, a survey of activities in marine science and technology. The Secretary General was also directed, as part of this study, to formulate proposals for expanding international cooperation and for improved marine education and training. In recognition of the complexity of the subject, the Secretary General was given until 1968 to report the results of his study and his recommendations.

Through its past activities, the United Nations has already built a solid record of accomplishment in dealing with questions concerning the oceans. It has been responsive to the needs of nations and has dealt effectively with problems as they arose.

The immediate question before the Assembly today is this: How can the General Assembly, in the light of the continuing advance of marine technology, best act to encourage the exploration and use of the ocean and its floor for the benefit of all mankind?

This is a very complex matter, and any decisions we make must recognize the full complexity of the problems involved. A hasty approach would be imprudent. But all deliberate speed and not indefinite delay is what is called for.

What this Assembly needs is an instrument which would enable it to deal with both the scientific and the legal questions involved. Recalling the work and accomplishments of the Outer Space Committee, my Delegation proposes that the General Assembly take action this session to establish a Committee on the Oceans. This Committee would:

- act as a servant of the General Assembly in considering all proposals placed before the Assembly on marine questions, and make recommendations on such proposals to the Assembly for action;
- assist the General Assembly in promoting long-term international cooperation in marine science; and
- assist the General Assembly in considering questions of law, including such matters as rights of use and exploration, arms control, and problems of pollution.

Such a committee would work with existing United Nations agencies and the ENDC, as appropriate, drawing upon their experience and their resources. The General Assembly should ask the Committee, as part of its initial work program, to make recommendations for action by the 23rd and subsequent General Assemblies to stimulate and support international cooperation and exchange in the exploration of the ocean floor.

Any extensive program for international cooperation in the exploration of the ocean floor would necessarily be a long-term effort and would require the careful harmonization of national programs and of the efforts of the specialized agencies. Under the Marine Resources Act of 1966, the United States has already begun to establish a coordinated long-range program in marine science, and we stand ready to do our share in developing a comprehensive program of international cooperation.

As part of its first report, the Committee might provide the Assembly with its views on the recommendations developed by the Secretary General in his study requested by last year's General Assembly, of activities in marine science and technology.

Finally, Mr. Chairman, my Delegation believes that the General Assembly, through the new Committee on Oceans, should begin immediately to develop general standards and principles to guide states and their nationals in the exploration and use of the deep ocean floor. All of our knowledge about the deep ocean floor and all of our technological skill in exploiting its resources could prove of little value, if man's law-making faculty does not keep pace. Acting as the servant of the Assembly, the new Committee could study how states might best conduct their activities on the deep ocean floor so as to maintain international peace and security and promote international cooperation, scientific knowledge, and economic development. It could also consider what principles might be agreed upon to help conserve the living resources of the seas, to prevent pollution, and to avoid disturbance of the biological, chemical and physical balances of the seas.

I do not wish to imply that the task of developing legal principles for the deep ocean floor will be simple. The question of definition of the deep ocean floor will have to be considered. The work will have to take into account existing treaties, including the Convention on the Continental Shelf. These treaties confer rights which are valued and retained by the signatories.

Questions of arms control must also be an essential part of our consideration of the oceans. Complex as these questions are, they must be taken into consideration if we are to develop meaningful principles to govern future state behavior. The United States Delegation believes that we must seek effective arms control measures as part of the evolving law of the deep ocean floor and that their development should also come under the mandate of the Oceans Committee.

While my Delegation believes that it is too early to take any final decisions on proposals for a comprehensive legal regime for the deep ocean floor, such as suggested by Ambassador Pardo, we would participate energetically in the studies which will be needed before such decisions can be made.

Mr. Chairman, the program I have suggested would represent an ambitious undertaking for the Assembly. The problems ahead are vast. Yet the opportunities are equally vast.

A Committee on Oceans, building on the present efforts of member states and the United Nations, could serve as the focal point within the General Assembly for study and development of the next steps which the nations must take together in this field. In creating this Committee, and directing it toward the tasks ahead, we would take effective action to enhance our knowledge of the ocean and its floor—and to use it for the long-term benefit of the human family.



